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ABSTRACT

This manual presents the rationale and coding system for the study of dyadic interaction between teachers and children in classrooms. The introduction notes major differences between this system and others in common use: 1) it is not a universal system that attempts to code all classroom behavior, and 2) the teacher's interactions in his class are recorded and analyzed separately for each individual student. The five different types of dyadic interaction situations which the system codes are each described: response opportunities, recitation, procedural contact, work-related contact, behavioral contact. Explanations are given of the various categories and sub-categories of behavior within each type, e.g., for a response opportunity behavior the coder identifies the child and codes the type of question (four types), the level of question (four levels), the quality of the child's answer (four categories), and the teacher feedback reaction (12 types). General coding conventions are discussed and instructions given for using the two coding sheets. Appendixes contain 1) the General Class Activities Coding Sheet, 2) the Reading and Recitation Group Coding Sheet, 3) discussion of additional variables not included in the system (to illustrate that it is an open system which may be modified), 4) 20 pages of coding examples, 5) explanation of derivation of scores from raw coding, and 6) recommendations for establishing intercoder reliability and assuring validity. (JS)

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TEACHER-CHILD DYADIC INTERACTION: A MANUAL FOR CODING CLASSROOM BEHAVIOR

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INTRODUCTION

This manual presents the rationale and coding system used by the authors to study dyadic interaction between teachers and children in classrooms. Emphasis is stressed on the word dyadic, since the manual applies only to those classroom interactions in which the teacher is dealing with a single, individual child. There are two major differences between the present system and other systems in common use: (a) it is not a universal system that attempts to code all classroom behavior -- expository lecturing and other situations in which the teacher is addressing himself to the entire class as a group are omitted entirely; (b) the teacher's interactions in his class are recorded and analyzed separately for each individual student, so that the student rather than the class is treated as the unit of analysis. Except for the observation aspects of behavior modification studies, classroom research on teacher-child interaction has tended to treat the class as a unit, ignoring intra-class individual differences in teacher-child contact patterns. The present authors have argued at length elsewhere (Good and Brophy, 1969) that this methodology is not always appropriate for the kinds of questions which have been investigated with it. In addition, it is specifically inapplicable to studies that focus on intra-class individual differences, including studies of communication of differential performance expectations by teachers. The coding system to be presented was developed specifically for the latter research purpose, although it is applicable to a much wider range of studies of teachers' and pupils' classroom behavior.

In stressing the need to shift from the class to the individual student as the basic unit of analysis in classroom observation studies, Good and Brophy (1969) question two tacit assumptions made at least implicitly by investigators who study teacher effectiveness with observation and coding systems using the class as a unit. These two assumptions are: (a) intra-class individual differences in the way the teacher interacts with different children are of little or no importance relative to inter-class differences among teachers; (b) the teacher behavior variables involved are properly conceptualized as interactions between the teacher and the class as opposed to interactions between teacher and individual children. The first assumption is called into question by a review of the literature of classroom observation studies which shows that differences between sex, SES, racial, and other groups are regularly found when investigators look for them and that large intra-class variability on the measures taken is the rule rather than the exception. Given the large individual variation within a class, the second assumption may also be questioned, since it follows that the teacher's average score on traditionally studied variables such as warmth or indirectness may not accurately reflect the way he actually treats the majority of the students in his classroom. For example, the teacher who is neutral toward the majority of his students but warm and rewarding towards a subgroup might appear moderate to high on a measure of teacher warmth derived from a typical observation system using the class as the unit. In such a bimodal situation, there is no "typical" or "average" teacher warmth; in effect, the majority of the children are experiencing low teacher warmth. Use of an averaged frequency score inaccurately portrays both the teacher's general behavior and the degree of teacher warmth experienced by individual pupils.

In view of the preceding considerations, we conclude that observation of dyadic teacher-child interaction is the method of choice not only in research concerning individual differences among the children in a class, but also in research on teacher effectiveness, which frequently has been approached through systems using the class as the unit.

Teacher warmth, teacher indirectness, and other teacher variables which have usually been studied with the latter methods are variables of teacher behavior which are usually directed to individual children rather than to the class as a group. They are, in effect, variables of dyadic interaction and should be conceptualized as such. The relatively weak effects that have been reported in studies of teacher effectiveness using such variables may be a result of failure to take into account intra-class individual variation rather than a result of weakness in the variables themselves as predictors of student performance. A change in research design from the class to the individual as the unit of analysis would be more appropriate conceptually and more powerful statistically for evaluating the importance of these teacher behaviors.

Although the system to be presented below does not involve coding everything that goes on in the classroom, it does attempt universality with reference to the class of dyadic contacts: every interaction between the teacher and an individual child is coded. In addition, several aspects of the system involve preservation of the sequential nature of teacher-child interaction, so that cycles of initiation and reaction are not lost in the coding process. This feature is especially important for studying the communication of performance expectations, since it allows separation of effects due primarily to the teacher from effects due primarily to the child. The system also allows for the conversion of raw codes from the individual children into percentage scores which neutralize the effects of differences in the absolute frequencies of various types of interactions they have with their teacher. Teachers' interactions with particular children or subgroups of children may then be compared directly with interaction in equivalent situations with other individuals or groups. In this way, quality of contact (what the teacher does when engaged in certain kinds of interactions with the child) and quantity of contact (the sheer frequency of the different kinds of interactions) may be studied separately and evaluated. Finally, data for the entire class treated as a group may also be obtained by combining the codes for the individual members.

The behavior categories and coding procedures presently being used to study communication of performance expectations in the classroom are presented below. To simplify presentation, only those behaviors actually being coded with the present system are presented in the body of the manual. The coding sheets used in gathering data in the classroom from this manual are presented as Appendix One (General Class Activities Coding Sheet) and Appendix Two (Reading and Recitation Group Coding Sheet). A discussion of other behavior variables, which could have been studied but were excluded from the present research for theoretical and/or practical reasons, is presented in Appendix Three. Discussion of these variables is deferred until the appendices because they do not appear on the coding sheets shown in Appendices One and Two. Incorporation of these additional variables (or any others) would require redesigning of the coding sheets to accomodate the new categories. Mention of the material in Appendix Three is made here at the beginning of the manual, however, because it points up an important fact about the system to be presented in particular and the notion of coding dyadic interaction in the classroom in general: The system to be presented should not be conceived as a finished, closed system to be used without modification. Different research questions may require the coding of different variables and/or a different approach to coding some of the same variables included in the following system.

GENERAL OVERVIEW

Five different types of dyadic interaction situations are coded in the present system:

1. Response opportunities, in which the child publicly attempts to answer a question posed by the teacher.
2. Recitation, in which the child reads aloud, describes some experience or object, goes through arithmetic tables, or makes some other extended oral presentation.
3. Procedural contacts, in which the teacher-child interaction concerns permission, supplies and equipment, or other procedural matters concerned with the child's individual needs or with classroom management.
4. Work-related contacts, in which the teacher-child interaction concerns seat work, homework, or other written work completed by the child.
5. Behavioral contacts, in which the teacher disciplines the child or makes individual comments concerning his classroom behavior.

These five broad categories of teacher-child interaction are kept distinct from one another in coding, and each type has its own place for coding on the coding sheets (see Appendices One and Two). In addition to this physical separation of the coding for the five types of dyadic contacts, coding distinctions are also made concerning the nature and sequence of the interaction observed. For every interaction, coders note whether the initiator was the teacher or the child and also code information concerning the teacher's message or response to the child during the interaction. In addition, the coding of response opportunities and recitation turns also includes information concerning the type of question asked and the quality of the child's response, both of which are coded before coding the nature of the teacher's feedback. The latter coding also includes preservation of the sequential order of events, so that the chain of action and reaction sequences within these interactions is maintained.

Although the two coding sheets look quite different from each other physically, the only essential difference between them is that the reading and recitation sheet (Appendix Two) has a special section to be used during reading group or other recitation situations. The columns for coding response opportunities, teacher-afforded dyadic

contacts, and child-created dyadic contacts have the same meaning and are coded in the same way on both sheets. The difference in physical appearance between the two coding sheets is due solely to lack of space on the reading and recitation sheet which required compression of the space provided for coding certain types of interaction. The spaces for coding procedural, work related, and behavioral interactions were nested atop one another in a few columns on the page rather than spread out next to one another as on the general class-activities sheet.

RESPONSE OPPORTUNITIES

The coding of response opportunities is perhaps the most difficult coding in the system, since several aspects of the interaction have to be coded and the sequence of events within the interaction must be maintained and indicated in the coding. To some extent the sequential aspects have already been designed into the coding sheet, since in going from left to right the coder takes up coding decisions in the order in which they tend to occur naturally: first, he indicates the code number of the child making the response and the type of question he is responding to; then he codes the level of question; then he codes the quality of the child's answer; then he codes the teacher's feedback to the child's answer. Each of these aspects of coding response opportunities is described in turn below, after clarification concerning the term "response opportunity."

Three key aspects characterize "response opportunities" as they are defined in this system: (a) they are public interactions between the teacher and only a single child at a time, but nevertheless meant for and monitored by the entire class or by the entire group operating at the moment (such as the reading group); (b) they occur when the teacher asks a question demanding a verbal response from the child or when she asks the child to publicly respond to a question requiring a non-verbal response (such as indicating something on the board, pointing to the right letter or word, etc.); (c) only a single individual child makes the response (chorus or unison responses in which two or more children call out the answer simultaneously are not considered "response opportunities"). Thus a response opportunity involves a public attempt by an individual child to deal with a question posed by the teacher.

Other types of teacher-child interaction are not coded as "response opportunities" because they differ from the preceding definition in one or more ways. It is important for coding validity to bear in mind that "response opportunities" as used in this system are considered to be teacher afforded; it is assumed that the teacher explicitly or

at least implicitly wants the child involved in the interaction to answer the question. Response opportunities are deliberate teacher attempts to get a child to respond, or at least implicit teacher encouragement in situations where the child seeks out a response opportunity (see "call out" below). Response opportunities thus involve individual recognition of the child by the teacher. The previously mentioned situation in which two or more children call out an answer simultaneously is not considered a "response opportunity" because no individual child receives individual recognition or feedback. Even if only a single child calls out the answer, a response opportunity is coded only if the teacher responds to him in some way. Should the teacher ignore his answer altogether, it is not considered a response opportunity. Examples to help clarify the coding of "response Opportunities" are presented in Appendix Four, which contains both typical and borderline examples of all of the variables in the system.

The public nature of the "response opportunity" distinguishes it from the various forms of teacher-afforded and child-created dyadic contacts (procedural, work-related, and behavioral). In the teacher-afforded and child-created work-related contacts, the teacher talks to the child about his own individual seat work. Teacher feedback here is "private," meant only for the child involved and not for the class as a whole. These contacts occur when individual children bring their work to the teacher to ask him about it or when the teacher goes around the room correcting work individually at each desk. It frequently happens that the teacher will question a child when dealing with him individually about his seat work. Such an event is coded under work-related dyadic contacts and is not considered a "response opportunity," since the question is meant only for the particular child involved and is not a public question.

Response opportunities must also be distinguished from reading and recitation turns, which sometimes is difficult. The major distinction is that response opportunities are initiated by a teacher

question which requires a focal, circumscribed answer. Reading and recitation turns are more extended performances by the child, in which he responds at length to an initial question or command. Ordinarily these will involve verbal demonstration of mastery (overlearning) of skill, as when reading aloud in reading groups or reciting mathematics tables. These two types of interaction must be separately coded because the appropriate units for analyzing the data coming from them are not the same. Response opportunities involve focal questions which, along with the answer given by the child and the ensuing feedback, form a natural unit. Each such question-answer-feedback segment constitutes a self-contained interaction sequence in its own right, easily separable from preceding or following units, even when they involve the same child. Reading and recitation turns, on the other hand, cannot be so easily unitized. In these situations, the child's performance in carrying out the task determines the number of appropriate or expected interactions with the teacher. That is, a child who reads his selection or goes through his tables without error will ordinarily receive a teacher reaction only at the end, when he finishes. The child who gets stuck or makes errors, on the other hand, will get teacher intervention in the form of corrective feedback or attempts to get the child to correct himself at each instance in which he fails to produce the correct response. A perfect reading or recitation goes uninterrupted and involves response by the teacher only at the conclusion. Imperfect recitation is interrupted as many times as the child makes a mistake or is unable to respond, with teacher intervention occurring at each juncture.

In view of the foregoing, the two types of interaction cannot be added together in analyzing the data, since this would dissipate the validity of the interpretation of response opportunities as teacher-afforded. The child who made frequent mistakes in reading and recitation turns would appear to have more response opportunities if each of his mistakes and ensuing feedbacks were treated as separate response opportunities. In effect, his higher score would be due to

his poor performance in reading and recitation rather than to any teacher tendency to interact more frequently with him. Because of these validity considerations, it is necessary to code recitation turns separately so that problem corrections during recitations do not get counted as response opportunities. Whenever the response demand on the child is such that he will continue responding until and unless he makes a mistake, the interaction should be coded as a reading or recitation turn and not as a response opportunity.

Information is entered on the coding sheets through a combination of numbers, check marks, and care in placing both of these in the proper rows and columns. Each child in the class will be identified by number. Assignment of numbers may be alphabetically, according to seating arrangements, or some other system convenient to the investigator. If investigation is going to continue over a long period of time it is recommended that the children be numbered alphabetically, since most teachers will rotate seating periodically. The number "17" appearing on the first line of the general class activities sheet in Appendix One indicates that the interaction involves child number 17 in the class being observed. All interaction involving this particular child in that class will be indicated with the number "17." Each response opportunity which is coded requires coding of five separate bits of information: the identity of the child, the type of response opportunity, the level of question asked, the quality of the child's answer, and the nature of the teacher's feedback response. The last item to be coded (teacher's feedback) sometimes will be complex enough to include two or more of the categories of teacher feedback, so that some response opportunities will require six or more separate markings.

Notation of both the identity of the child getting the response opportunity and the type of response opportunity involved is accomplished with the first coding entry. Four types of response opportunity have been identified: discipline questions, direct questions, open questions, and call outs. These will be defined below. When a response opportunity occurs, the coder enters the child's identification number under the

appropriate column depending on whether it is a discipline, direct, open, or call out response opportunity. Thus in a single motion, the coder records both bits of information: The number identifies the child and the column in which the number is placed identifies the type of response opportunity. In the first example given in Appendix One the number "17" is under the direct questions column, indicating that the teacher asked a direct question of child number 17. The types of response opportunities are as follows:

Discipline Questions

The discipline question is a unique type of direct question in which the teacher uses the question as a control technique, calling on the child to force him to pay better attention rather than merely to provide a response opportunity in the usual sense. In coding a discipline question the coder should be convinced that the teacher deliberately called on the child involved because of poor attention or cooperation. Usually this will involve direct evidence in the teacher's subsequent behavior, as when he responds to the child's inability to answer with a statement such as "Maybe if you payed better attention you'd know the answer." Thus discipline questions should be conservatively coded; the fact that the teacher may ask a direct question of a child who has not been completely attentive in the preceding moments does not by itself constitute enough evidence to code the discipline question. There must be some indication that the teacher has deliberately called on the child to compel his attention.

Direct Questions

Except for the special case of discipline questions, all instances in which the teacher calls on a child who is not seeking a response opportunity are coded as direct questions. Direct questions are the clearest examples of teacher-afforded response opportunities. In contrast to open questions and call outs, in the direct question the child does not raise his hand, call out an answer, or otherwise indicate that he wants to respond. Instead the teacher calls on him to respond without any indication of interest or willingness on his

part. Thus, whenever a teacher publicly asks a question (thereby creating a response opportunity) and calls upon a child who does not have his hand up to answer it, it is coded as a direct question. This includes instances in which the teacher calls on a child before he has a chance to raise his hand (as when he names the child before asking the question) as well as instances in which the teacher calls on a child who does not have his hand up rather than on one who does.

Open Questions

In the open question, both the teacher and the child are involved in determining who gets the response opportunity. Here the teacher asks a question, waits for the children to raise their hands, and then calls on one of the children who has his hand up. The teacher creates the response opportunity by asking a public question, and also indicates who is to respond by calling on an individual child, but he chooses one of the children who has indicated a desire to respond by raising his hand. Thus, the open question is a response opportunity which is partly teacher-afforded and partly child-created.

Occasionally there will be difficulty distinguishing between a direct question and an open question. This occurs when the teacher poses a question and waits for children to raise their hands, but calls on a child whom the coder has not been watching. The coder must quickly check to see if the child had his hand up or not. If the teacher has called on a child with his hand up, the response opportunity should be coded as an open question; if he has called on someone who did not have his hand up, it should be coded as a direct question. Whenever the coder is not sure whether or not the child had his hand raised, the response opportunity should be coded as an open question. This means that the category of direct questions will be kept restricted to those instances in which coders are certain that the teacher called on a child who did not seek out an opportunity to respond. The category of open questions will then include both instances in which the coder is certain that the teacher called on a child who raised his hand and instances in which the coder is not certain whether or not the child raised his hand.

Call Outs

Response opportunities created by children who call out answers to teachers' questions without waiting for permission to respond are coded in the call out column. The teacher creates the response opportunity by asking a public question, but one child calls out an answer to this question before he has a chance to indicate that a particular child should respond. This type of response opportunity is therefore child-created, in that it was not the teacher's intent that the child answer the question. Besides those already mentioned, one additional consideration must be present before coders code a response opportunity under call out: the teacher must recognize the child's response and make some response to the child in reaction to it. Called out answers which are ignored by the teacher are not considered response opportunities and are not coded. A response opportunity coded as call out then, requires the following: (a) the teacher asks a public question; (b) the child calls out an answer to the question before the teacher has a chance to call on anyone to respond; (c) the teacher then turns his attention to the child who called out the answer and says something in response to him. The teacher's response to the child must contain feedback regarding his answer to the question; the interaction is not coded as a response opportunity under call out if the teacher confines her remarks to criticism of the child for calling out the answer. It is necessary, therefore, that the teacher make some feedback response to the child who calls out the answer.

Just as there may be confusion in distinguishing between direct questions and open questions when the coder is unsure whether or not the child has raised his hand, there may also be confusion in distinguishing between open questions and call outs if the coder is unsure whether or not the teacher made some indication to the child that he should answer the question. There is usually little problem when the teacher calls on the children by name, but some teachers will call on children by pointing at them or otherwise non-verbally indicating that they should make a response. Coders should be particularly

alert with such teachers to pick up these less obvious cues given to children to signal their permission to respond. When the coder is not sure whether or not the teacher made such a signal, and therefore is not sure whether or not to code an open question or a call out, the interaction should be coded as a call out.

The decision rules in handling ambiguous situations regarding coding of the type of response opportunity may be summarized as follows: (a) indecision between discipline question and direct question is resolved by coding direct question; (b) indecision between direct question and open question is resolved by coding open question; (c) indecision between open question and call out is resolved by coding call out. In each case the decision rule involves coding the category that implies less about the teacher's intent. The discipline question implies that the teacher deliberately calls on a child because he has seen that the child is not paying attention and wishes to compel his attention; the direct question implies less than this, only that the teacher deliberately intends to provide a response opportunity to a specific child; the open question implies a deliberate provision of response opportunity to a specific child, but this decision is affected by the fact that the child is one of those with his hand up seeking an opportunity to respond; the call out implies nothing about the teacher's intention concerning provision of response opportunity since the child calls out an answer before he has a chance to provide a response opportunity.

By following the decision rules for handling the ambiguous situations outlined above, coders will, in effect, err on the side of conservatism in implying intent on the teacher's part. This procedure helps insure the validity and interpretability of the coding from systematic differences in coders' handling of ambiguous coding situations. Decision rules guided by the same rationale will be provided for resolution of other coding difficulties in which the coder is unable to choose on the evidence between two categories. In each case the procedure will involve resolving the difficulties by coding the category which implies less about communication of teacher expectations. Thus, whatever evidence exists in the coding for the existence of behavioral correlates of teacher expectations will be conservative estimates of expectation effects.

LEVEL OF QUESTION

After noting the type of response opportunity and the identity of the child involved by entering the child's number in the appropriate column, the coder now codes the level of question asked by the teacher. Level of question refers to the nature of the response demand made upon the child. Four levels are identified: process questions, product questions, choice questions, and self-reference questions. The first three levels refer only to questions about academic or school-related content. The fourth category (self-reference questions) is used to code all questions that do not refer to academic subject matter.

Such questions do not have objectively verifiable, right or wrong answers. Instead they ask the child for his opinions or reactions, or they ask about his personal experiences, home life, or other factors in his personal background. The four levels of question are defined as follows:

Process Questions

This is the most complex level of question, in which the child is required to explain something in a way that requires him to integrate facts or to show knowledge of their interrelationships. It most frequently is a "why?" or "how?" question, and usually requires an extended phrase or sentence for formulating an adequate response -- single word answers are not usually sufficient. A process question requires the child to specify the cognitive and/or behavioral steps that must be gone through in order to solve a problem or come up with an answer.

Product Questions

Product questions seek to elicit a single correct answer which can be expressed in a single word or a short phrase. Product questions differ from process questions in that they only require knowledge of a specific fact and do not force the child to integrate several facts or to make inferences from them. Product questions usually begin with "who?," "what?," "when?," "where?," "how much?," or "how many?." Many of the response opportunities in the early school grades will be

coded as product questions, as when the child is asked to read a word, identify a letter, produce a sum or remainder, etc. While the child may have to go through many cognitive processes in order to arrive at the answer, the question itself as asked does not require him to verbalize these processes but only to produce the answer. So long as this is true the question is a product question, and the response demand on the child is less than it is for a process question, since less is required of the child and since the possibility remains that he might guess the answer without knowing the process that the teacher wants him to know.

Choice Questions

In the choice question the child does not have to produce a substantive response but may instead simply choose one of two or more implied or expressed alternatives. Included are yes-no questions, either-or questions, and questions which present more than two alternatives but which make it clear that the correct answer is one of the alternatives presented. Choice questions are of interest because they tend to encourage guessing by maximizing the child's chances of producing correct answers (response products), even though he may lack the correct knowledge or skill (response process) that the teacher assumes to be operating when children answer correctly. Choice questions involve a more limited response demand upon the child than do product questions, since unlike the latter they do not require the child to produce a substantive response on his own; the child knows that the correct answer is one of the alternatives the teacher presents in asking the question, and if he is disposed to guess he can make a response by indicating one of those alternatives. Occasionally a large number of alternatives will be present, as when the teacher asks the child to indicate or underline one particular letter of the alphabet (out of the 26). This nevertheless is still coded as a choice question because the child knows that the correct answer is one of the alternatives presented. When the alternatives are presented verbally, there are usually only two or three alternative categories of response.

Note that certain kinds of questions which might appear to be quite complex may nevertheless be coded as choice questions. A question such as: "Which exerts the greater influence over world population figures at present -- increased use of birth control devices or reduction of death rates due to medical and health improvements?" is coded as a choice question because it is essentially an either-or question in which the respondent can take his choice between one of two alternatives. The key factor, then, in choosing among process, product, and choice questions is not so much the content of the question itself but the level of response demand made upon the child.

Self-Reference Questions

The preceding distinctions between process, product, and choice questions apply only to questions dealing with academic subject matter. They require the child to demonstrate some academic skill or to respond to a question demanding factual knowledge. The three types of questions differ from one another in the complexity of response demand made upon the children, but they have in common the fact that they apply only to academic subject matter. The category of self-reference questions includes all teacher questions which do not fit the preceding three categories because they ask the child to make some non-academic contribution to classroom discussion ("show and tell," questions about personal experiences, preferences, or feelings, requests for opinions or predictions, etc.). Self-reference questions will often occur during breaks in academic routine for "show and tell" or similar activities, although they may also be asked at any time during formal lessons. They often occur when the teacher is introducing a lesson for the day ("Have you ever planted a plant?" "Have you ever been to the zoo?"). Questions such as these, while relevant to the coming lesson, do not require the child to show skill or knowledge of academic subject matter; they merely ask him about his previous experiences.

The distinctions made previously between process, product, and choice questions within the realm of academic questions do not apply

to self-reference questions. That is, any question which is a self-reference question is simply coded as such, regardless of the apparent response demand built in to the question. Most self-reference questions take the form of choice questions and would be coded as such if they were academic questions. The child is asked an either/or question or a question which is answered yes or no. Coders should be particularly alert to avoid confusing the coding of such questions. If the question deals with knowledge or skills it is coded as a choice question; if it deals with personal experiences, opinions, or other non-academic matters it is coded as a self-reference question. The proper coding of level of question therefore requires two separate coding decisions: (a) first the coder must decide whether it is an academic question or a self-reference question; (b) if it is an academic question the coder must also decide whether it is a process, product, or choice question. The latter distinctions are not made among the self-reference questions, which are coded under the single label.

Confusion between academic questions and self-reference questions must be resolved by determining the teacher's intent. Often the question as asked will be ambiguous ("What do you think would happen if..."), and the coder will have to await the teacher's feedback to the child's response in order to determine how he is going to treat the question. If the teacher is searching for a particular kind of answer and treats the children's responses as right or wrong, the question is treated as an academic question. On the other hand, if the teacher simply accepts any answer that the child gives and seems to be merely trying to get the children to talk or to make a guess, the question is treated as a self-reference question. In general, then, if the teacher seems to be using the question to test or teach academic knowledge, the question will be coded as process, product, or choice. If he treats the children's responses as opinions or guesses and does not evaluate them as correct or incorrect, the question is coded as self-reference. Annotated examples of this distinction, and also of the distinctions between the types of academic questions (process, product, and choice), are provided in Appendix Four.

CHILD'S ANSWER

After coding the child's identity, the type of question, and the level of question, the coder notes the child's answer into one of four categories: correct, partially correct, incorrect, or no response. The teacher's intent is taken into account in determining the correctness of the child's response. Frequently teachers may ask ambiguous questions which are answered correctly or partially correctly from one point of view but which are treated as incorrect by the teacher, who was looking for a very specific answer. Thus it is the teacher's perception of the correctness of the child's response which is coded, not the coder's perception. This distinction is important because the next variable coded is the teacher's feedback to the child's response, and this feedback is considered to be feedback to the child's answer as perceived by the teacher. Consequently if the teacher reacts to a response as if it is wrong it is coded as wrong, even though another observer might consider it to be partially or even completely correct.

Correct Answers

If the child answers the teacher's question in a way that satisfies him, the answer is coded as correct. Determination of whether or not the teacher is satisfied with the child's answer does not necessarily require that the teacher positively affirm the answer or make some favorable response to it. Instead, the child's answer should be considered correct unless the teacher makes some positive action suggesting dissatisfaction with it (explicitly explaining that the child's answer is incorrect or only partially correct, giving the "correct" answer, or asking someone else to answer the same question). If the teacher does not make an attempt to improve upon or replace the child's answer with another, his answer is considered correct. This means that some answers that the coder would not accept but which the teacher treats as correct are to be coded as correct answers.

Part-Correct Answers

Part-correct answers are answers which are correct but incomplete as far as they go or answers which are correct from one point of view

but not the answer that the teacher is looking for. Again, the teacher's feedback response may determine the way the answer is coded. If the teacher indicates that the child's response is correct but incomplete, or if he indicates that the response is correct or defensible but not the answer that he is looking for, code the response as part-correct.

Incorrect Answers

Responses coded as incorrect answers are those in which the child's response is treated as simply wrong by the teacher. The teacher need not explicitly tell the child that he is wrong; he may indicate this indirectly by searching for the answer from someone else or by providing it himself. In one of these ways the teacher indicates that the child's answer is not an acceptable response to the question he has asked.

No Response

The preceding three types of answers (correct, part-correct, and incorrect) all refer to instances in which the child makes a substantive response to the teacher's question. All cases in which he fails to do so, either by making no response whatever or by indicating through word or gesture that he cannot answer the question, are coded as no response. The child need not make some positive action to be coded in this category; if the teacher asks him a question and waits a time for an answer but then moves on to somebody else when he does not respond, the first child is coded for no response. Occasionally an ambiguous situation will arise when the child mumbles something indistinct. If the teacher reacts in this situation as if he has understood the child to make a substantive response, the response will be coded in one of the preceding three categories. If the teacher cannot understand the child, he is coded for no response.

TEACHER'S FEEDBACK REACTION

After identifying the child by number, coding the level and type of question, and coding the quality of the child's answer, the coder completes the sequence for coding response opportunities by indicating the nature of teacher's feedback reaction to the child's answer. This is sometimes more complicated than the previous coding because in reacting to the child's answer, the teachers may produce behavior which is codable in more than one of the feedback categories. In such instances it is necessary not only to make a check mark in the appropriate column, as in the previous coding, but also to indicate the nature and sequence of any subsequent codable feedback behavior by placing a "2" in the column representing the feedback category which occurs next, a "3" in the column representing the category which occurs next, etc. Thus if the teacher's feedback reaction includes only one codable behavior there will be only a check mark under the appropriate column. If his response includes more than one codable behavior there will also be numbers in other columns which represent the occurence of other codable feedback and indicate the serial order of the occurrence. When properly coded in this manner, the salient points of each response opportunity can be recreated in the order in which they occurred by reference to the coding sheets. For example, the first row of entries on the general class activities sheet in Appendix One is interpretable as follows: child #17 was asked a direct question which was a product question; he answered the question correctly; the teacher reacted to his answer first by affirming that it was a correct answer and secondly by praising him.

Before defining the categories of teacher feedback in detail, the category titles will be listed below to provide an overview. The categories, along with the symbols used to indicate them on the coding sheets, are as follows:

SYMBOL	FEEDBACK REACTION
++	Praise (positive evaluation)
Affirms Right	Affirmation after a correct answer (positive feedback)
0	No feedback response -- teacher does not react to child's answer
Negate Wrong	Negation after a wrong answer (negative feedback)
--	Criticism (negative evaluation)
Pcss	Process feedback
Giv Ans	Gives correct answer (without getting into process)
Ask Oth	Asks another child to give the answer
Call	Call Out (some other child calls out the answer before the first child responds to the question)
Rept	The teacher repeats the question
Reph or Clue	Teacher rephrases the question or gives a clue
New Q	Teacher asks a new question

The first nine of the twelve categories listed above are designated as "terminal" feedback, while the last three are called "sustaining" feedback. This is one of the key distinctions involved in studying communication of teacher expectations. The categories of sustaining feedback include teacher behavior which prolongs the response opportunity by providing a second chance to deal with the same or related questions. Use of sustaining feedback reactions is an index of the teacher's willingness to stick with the child until he can produce an acceptable answer. Terminal feedback, on the other hand, brings the response opportunity to a close. With terminal feedback reactions the teacher either gives the child the answer or sees that he gets it from someone else, or merely makes a feedback or evaluation response without supplying the answer. In either case, he does not sustain the interaction and provide additional response opportunities.

The terminal feedback categories may also be profitably subdivided for some purposes to the first five categories, which do not involve a substantive response or answer, and the second four categories, which do involve such an answer. The 12 categories, then, may be summarized as follows: the first five categories of terminal

feedback provide the child only with affirmation, negation, or evaluation, and not with substantive information; the last four categories of terminal feedback do provide substantive information to the child, either from the teacher or from one of the other children; the final three categories (sustaining feedback) provide the child with a second response opportunity, either to answer the same question or to answer a related one. The categories are defined so as to be mutually exclusive but not contradictory, so that more than one category may apply to a given teacher feedback reaction. In such cases, each new category of teacher feedback is simply noted in the order in which it occurs. Certain types of multiple-category teacher feedback reactions require special coding conventions, but discussion of these will be deferred until the categories themselves are presented in more detail below.

Praise

Praise refers to the teacher's evaluative reactions which go beyond the level of simple affirmation or positive feedback by verbally complimenting the child ("Good," "Fine," "Wonderful," etc.) and/or by accompanying verbalization of positive feedback with expressions or gestures connoting excitement or warmth. Thus praise is coded when the teacher does something more than merely indicate that the child has given a correct response. He communicates a positive evaluation or a warm personal reaction to the child and not merely an impersonal communication of information.

Affirmation of Correct Answers

Affirmation is coded when the teacher indicates that the child's response is correct or acceptable. He may do this verbally ("Yes," "That's right," "Okay," etc.) or non-verbally (shaking his head up and down). Repetition of the child's answer is also coded as affirmation, unless the teacher does it with a quizzical expression or questioning tone of voice. Regardless of the particular method used, in each case the teacher provides immediate feedback to the child and indicates that his response is correct. Should he go beyond this by

making a statement that would be coded as praise, both affirmation and praise would then be coded.

The line between praise and simple affirmation is admittedly arbitrary. For the sake of consistency of coding, the verbal responses "Good" and "Fine" are always coded as praise even if delivered habitually by the teacher without any affective or expressive concomitants. When the teacher's response does not contain a verbal statement defined as praise ("That's right," "Yes") it is coded as simple affirmation unless the coder perceives the teacher to be communicating through expression or gesture a personal reaction of warmth or excitement.

No Feedback Reaction

If the teacher makes no response whatever following the child's answer to the question, he is coded for no feedback reaction. This means that he makes no verbal response to the child and does not communicate affirmation or negation by shaking his head in response to the answer. Instead, he merely moves on to something else, perhaps by starting to make a new point or by asking another child a question. Most coders will be surprised to find that this category is used much more often than they had expected. It frequently happens that the teacher makes no feedback reaction at all to the child's answer, especially in fast-moving question drills where he is pushing to get correct answers in an impersonal fashion, without paying attention to the individual child giving the answer.

In addition to the obvious condition of no feedback reaction outlined above, where the teacher says and does nothing in reaction to the child, one special type of teacher reaction is also coded in this category. This occurs when the teacher repeats the child's answer in a quizzical manner without indicating whether he considers it to be correct or incorrect. This reaction may frequently occur when the teacher is asking the children to guess, give opinions, or make predictions about something. In such instances he may reply to the child's answer ("He's going to go home and tell his mother") with

an ambiguous response ("You think he'll go home and tell his mother?"). Unless the teacher's feedback reaction is further elaborated to provide affirmation or negation or some substantive answer to the child, it is coded as no feedback reaction.

Negation of Incorrect Answers

Negation following incorrect responses parallels the category of affirmation following correct responses. In each instance, the teacher is simply providing impersonal feedback regarding the correctness of the response, and not going further than this by communicating a personal reaction to the child. As with affirmation, negation can be communicated both verbally ("No," "That's not right," "Hmm-mm") and non-verbally (shaking the head horizontally).

Criticism

Criticism parallels praise in that it refers to negative teacher evaluative reactions that go beyond the level of simple negation by expressing anger or personal criticism of the child in addition to indicating the incorrectness of his response. The category includes obvious verbal criticism ("That's a stupid answer," "What's the matter with you?" "If you'd pay attention, maybe you'd get it right") and verbal negation which is accompanied by expressive or gestural communication of hostility, anger, disgust, or sheer frustration. In general, any verbal response which disparagingly refers to the child's intellectual ability or, more frequently, his motivation to do good work, is coded as criticism. Statements of latter type by the teacher may be factually true (i.e., the child may not have been paying attention) or may be unverifiable gratuitous rejection ("You just don't care"). Both are nevertheless coded as criticism, since this coding refers to the teacher's behavior per se and not to the veracity or justification for his statements.

Process Feedback

The process versus product distinction introduced previously in discussing level of question is also used in coding the level of teacher feedback. Process feedback is coded in the present category,

while the following three categories refer to product feedback (simply giving the answer). Process feedback is coded when the teacher goes beyond merely providing the right answer and discusses the cognitive or behavioral processes that are to be gone through in arriving at the answer. In other words, she reviews the question or problem with the child at length, telling him how to go about responding to it and not merely what the correct answer is. Process feedback occurs most frequently following errors, when the teacher explains the reasoning processes to be gone through to arrive at the correct answer or explains the erroneous processes followed by the child to arrive at the wrong answer. Process feedback may sometimes follow correct answers, as when the teacher elaborates on the response to verbalize the process knowledge it represents ("Yes, we know that we should use a capital letter since it is a proper name, and all proper names begin with capital letters"). Teachers may provide process feedback by simply answering a process question, since by definition a process question requires a process answer. Other than this special situation, however, process feedback will usually require elaboration upon the answer to a question.

Gives Answer

This category is used when the teacher gives the child the answer to the question, but does not elaborate sufficiently to be coded for process feedback. The category is used only when the child has given a wrong answer or has not answered the question. When the teacher repeats the answer after the child has given it correctly it is coded as affirms right answer. Also, as noted above, when the teacher gives an answer to a process question it is coded as process feedback. Otherwise, any situation in which the teacher provides the answer to the question to which he has asked is coded as gives answer. Usually this will correspond to product feedback following product questions, although occasionally giving the answer to choice questions may also be coded here if the child does not take a guess and try to answer the question himself.

Asks Other

If the teacher does not answer the question himself but instead asks some other child to answer it, the feedback is coded as asks other. This category is coded regardless of the level of question or feedback involved (i.e., feedback to process questions is still coded under asks other if the teacher asks another child to provide the answer). Sometimes the teacher will ask another child very explicitly to answer the question that could not be handled by the first ("Johnny, can you help Mary?"). However, this need not be so explicitly stated for asks other to be coded. Whenever the child does not answer a teacher question and the teacher moves to another child in order to get the answer to that same question, the teacher's feedback reaction is coded for asks other.

Call Out

The call out category is used when another child calls out the answer to the question before the teacher has a chance to act on his own. This category is coded regardless of the level of question asked: if another child calls out the answer to the teacher's question before either the first child or the teacher himself can provide that answer, the feedback category call out is coded. Usually this will mean also coding a response opportunity for the child who called out the answer, provided that the teacher makes some individual response after he calls out the answer. In any case, the feedback coded for the first child is call out.

Repeats Question

This category and the two to follow comprise the categories of sustaining feedback, in which the teacher sustains the response opportunity and provides the child with a second chance to respond. The first such reaction is when the teacher simply repeats the question. This will almost always occur when the child has made no response, although it may also occur at times in which he has given an incorrect response. In any case, if the teacher asks a question, waits some time without getting the correct answer, and then repeats the question

to the same child, his feedback reaction is coded as repeats question. The teacher need not repeat the entire question word for word in order to be coded in this category. Truncated versions of the original question and short probes to determine if the child can make any response to the original question, are both coded as repeats question. For example, to the original question "What color is this?" the following responses are all coded as repeats question: "What color?" "Well?" "Do you know?" "John?" (The latter said in a manner that communicates that the teacher is waiting for the child to respond to his original question).

In each of the variants mentioned above, the teacher is communicating that he is waiting for the child to respond to the original question and that he still wants him to respond if he can. The teacher does not change the question, as in the following categories, but merely repeats it or refers to it as it was asked previously.

Rephrase or Clue

In this feedback reaction, the teacher sustains the response opportunity by rephrasing the question or giving the child a clue as to how to respond to it. Usually the rephrasing of the question in this situation will be such as to simplify it, particularly in moving from a product question ("What color is this?") to a choice question ("Is it red or blue?"). Rather than rephrase the question in this manner, the teacher may provide a clue expressed as a declarative statement: "It's the same color as an apple." Two key considerations determine the coding of rephrase or clue in teacher feedback: (a) the teacher does not merely repeat the question as originally asked but embellishes it in some way to make it easier for the child to respond; (b) nevertheless, he is still seeking the same response as asked for in the original question. The latter condition separates the present category from the category of new questions which follows, in which the teacher asks a new question which requires a different answer from the one asked originally.

The material provided by the teacher in rephrasing the question or giving a clue may or may not be helpful for the child -- certain types of clues may actually confuse him rather than help him. This fact should not be allowed to influence the coding. So long as the teacher does something which is intended by the teacher to help the child answer the original question, the teacher's action is coded as rephrase or clue.

New Question

The teacher asks a new question when she requires an answer that is different from the original question, although it may be closely related. A question requiring a new answer is coded as a new question. This is the only criterion. Thus to the original question "What color is this?", questions which elicit the same answer ("Is it red or blue?" "Is it red?") are coded as rephrase or clue. Questions which seek to elicit a different answer are coded as new questions ("Well, what color is this one?" "Have you been studying your homework?" "Is it bright or a dull color?").

The occurrence of sustaining feedback (repeats question, rephrase or clue, or new question) presents a special coding problem because this type of feedback gives the child a new response opportunity. This new response opportunity must then be coded for level of question, quality of answer, and additional feedback from the teacher. At the same time, the fact that it is a follow up to an original response opportunity rather than a wholly new response opportunity must be maintained in the coding system. This is accomplished by skipping down to the next row whenever sustaining feedback is coded, thereby bringing a close to the coding of the original response opportunity and beginning the coding for the follow up response opportunity. On the next row the level of question, the quality of the child's answer, and the nature of the teacher's further feedback is coded but the child's number is not repeated in the question type column. Thus coding of question type and identification of the number of the child involved is done only for original response opportunities; follow-up

response opportunities occurring due to sustaining feedback in reaction to the original response opportunities are coded only for level of question, quality of child's answer, and type of teacher feedback.

Proper coding of such a sequence is exemplified on the general class activities sheet in Appendix One, in rows 2, 3, and 4. Beginning in row 2, the coding example implies that the teacher asked a direct question of child number 6, that the question was a product question, that the child failed to give a response, and that the teacher reacted in this instance by repeating the question. After coding the preceding information as in row 2 in the example, the coder then moves down to row 3 and codes the information there which says the following: The question is a product question (since it is a repeat of the original question); the child this time answers incorrectly; the teacher reacts this time by negating the wrong answer and then by rephrasing the question or giving a clue. Since this sequence also culminates in the appearance of sustaining feedback, as noted by the "2" under the rephrase or clue column, the coder again skips a row and codes the third response opportunity of the sequence in row 4. In this instance, the coding in the example tells that the rephrased question was a choice question; that the child responded correctly this time; and that the teacher reacted by affirming the child's response as his terminal feedback. Thus in the example provided an original response opportunity as noted by the "6" in the column under the direct questions eventuated in three different response opportunities, each of which was coded for level of question, quality of child's response, and the type of teacher feedback. The coding allows for retention of all of this information in the sequence in which it occurred, as in the example in Appendix One. The fact that the sequence occurred as an original response opportunity that was followed up by two others rather than as three separate and unrelated response opportunities is also preserved in the coding.

Other than the special conditions requiring skipping to a new row when sustaining feedback occurs, the coding of teacher's feedback

reaction simply involves noting the appearance of new codable feedback categories in the order in which they appear. The coder merely enters a check mark or a "1" in the appropriate column for the teacher's first codable reaction; any additional codable reactions are numbered consecutively thereafter. It is rare that more than two or three such responses are recorded as teacher feedback to a single response by the child, although theoretically it would be possible for more to occur.

Note also that two or more occurrences of the same type of sustaining feedback (repeats question, rephrase or clue, or new question) may occur in succession and be coded separately. Thus a teacher might repeat the original question (or make some attempt to get the child to answer it) two or three times rather than just once. In such a situation, each repetition of the original question is coded, so long as there is some time in between which amounts to a new response opportunity being extended to the child. However, redundant repetition of the question ("Well -- do you know?") is coded as only a single repetition since no time for an opportunity to respond is allowed between parts of the question. When such time is allowed ("Well? . . . Do you know?"), two separate repetitions of the question are coded.

Redundant repetitions within the category of terminal feedback are <u>not</u> multiply coded. For instance, the comment "Yes, that's right, it's red" would simply be coded as one affirmation of the correct response (not as three such affirmations).

READING AND RECITATION TURNS

Because of the validity considerations explained previously, response opportunities that are of the particular type referred to as reading and recitation turns are coded on a separate sheet (see Appendix Two). Reading and recitation turns differ from other response opportunities in that the child is required to make an extended oral presentation rather than to give a circumscribed answer to a specific question. The amount of teacher-child interaction to be expected in connection with a given turn is dependent upon the performance of the child. The child who successfully completes his entire turn without error will ordinarily interact with his teacher only at the end or when she makes some comment about his performance as a whole. The child who frequently makes mistakes along the way, however, can expect the teacher to react to him each time he makes a mistake or gets stuck. Thus whenever the response demand made upon the child is similar to that just described rather than to the more usual response opportunity, the material should be coded on the reading and recitation coding sheet. The sheet is most frequently and typically used for coding the reading which is carried on in first-grade reading instruction. However, it should be used at any time when the present interaction suits the definition of reading and recitation turns, and the class need not be broken up into subgroups at the time. The type of response demand being made upon the child is the key determinate.

TYPE OF RECITATION

Identification of the child and coding of the type of recitation involved is accomplished by a procedure similar to that used in coding response opportunities. The coder enters the child's number under the appropriate column (self-reference recitation, work recitation, or reading turn). This information is entered only once -- at the beginning of each such turn. Interruptions of the turn for correction of mistakes by the child, for questioning the child about the material, or for other reasons are considered to be events occurring within the turn and do not result in the initiation of a new turn. Events occurring within the turn are coded in the sequence in which they appear, but the child's identification number is coded only at the beginning of the turn. Three types of recitation turns are identified: self-reference recitation, work-recitation, and reading turns.

Self-Reference Recitations

Self-reference recitations are coded when the children are called upon to present extended verbal descriptions and explanations of a non-academic nature. This most typically occurs in show-and-tell situations or similar activities in which the children describe their experiences, dreams, interests, etc. Any such extended presentation that is not related to academic work should be coded as a self-reference recitation. The coding is accomplished by entering the child's number under the self-reference recitation column (marked "self" on the reading and recitation sheet).

Work Recitation

This category includes all academic work recitations except reading turns. Examples would include reciting of memorized verbal material, retelling or paraphrasing a story read earlier, orally reviewing the multiplication or division tables, or any other extended oral presentation in which the child demonstrates some academic knowledge or skill. Work recitations differ from self-reference recitations in that the verbal contact is related to the academic curriculum

and is responded to by the teacher in terms of its correctness or incorrectness. Thus if a child is asked to retell a story just read in order to demonstrate his comprehension and memory of it, the interaction is coded as a work related recitation. On the other hand, if a child is invited to tell the class a story that he made up or that he heard somewhere, the recitation is coded as a self-reference recitation.

Reading Turns

The reading and recitation coding sheet will be used mostly to code reading turns. A reading turn is coded when the child is asked to read aloud some extended passage (not just one word), where the focus of the teacher's interest is explicitly upon his performance in reading. This most frequently occurs during reading groups, when the children generally take turns reading sections from a story. However, reading turns may occur at any time and do not necessarily occur only in small group activities. The key consideration is that the child is reading out loud publicly and that the teacher is correcting any mistakes in reading.

Reading turns are frequently interrupted for questions regarding content or other matters in addition to correction of reading errors per se. Such questions are treated as response opportunities and are coded in the same way as other response opportunities on the right side of the reading and recitation coding sheet. The left side of the sheet is used for coding only the child's performance at reading or reciting and the teacher's feedback at instances when he incorrectly performs the reading or reciting function. The procedures for coding the reading and recitation turns are described in the following section.

CHILD PERFORMANCE AND TEACHER FEEDBACK DURING READING AND RECITATION TURNS

The coding of child performance during reading and recitation turns follows similar principles to those used for response opportunities which involve a sequence of questions and answers and feedback from the teacher. That is, the origin of the turn is noted only once by entering the child's number under the appropriate column identifying the turn as self-reference, work-related, or reading. Each reading error and its associated teacher feedback are then coded separately, with the coder skipping to a new row once the teacher's feedback to a given error is completed. During reading and recitation turns it is <u>not</u> necessary to code the type of question, the level of question, or the quality of the child's answer, since these are understood given the context of the interaction. That is, the direct product question "Read the next word" is implicitly asked throughout the reading turn. Similarly, any inadequacy in the child's response is understood to be failure to properly read a word, since this is the only aspect of his response coded in the reading and recitation turn coding area. As noted above, any different type of response opportunity which would occur when the teacher asked a question is coded in the ordinary response opportunity coding area on the right side of the reading and recitation coding sheet.

Examples of proper coding of reading and recitation turns are presented in the reading and recitation coding sheet in Appendix Two. As with the previous coding, the information is conveyed through a combination of the child's identification number, check marks, and consecutively numbered coding of the teacher's sequential feedback, and, in this case, the use of the letter "E" to indicate the teacher's response at the end of the child's reading or recitation turn. For example, the first row of coding on the reading and recitation sheet in Appendix Two represents typical coding for a child who completed an errorless reading turn. The placement of the number "16" indicates the child's identity and the fact that the turn was a reading turn

rather than a self-reference or work recitation. The "E" indicates that the teacher made some affirmative comment regarding the child's performance when he finished reading. The following four rows contain a typical example of coding for a child who experienced some difficulty in reading. The information contained in this coding may be summarized as follows. First, the coder entered the child's identification number (17) under the reading turn column to indicate that he had a reading turn. The child then began reading and became stuck or incorrectly read a word. The teacher's first response at this point was to repeat the question -- to ask the child if he knew the word. This is indicated by the check mark in the second row under the repeat column. The child did not know the word so the teacher then gave the answer to him by telling him how to pronounce the word, as indicated by the "2" in the gives answer column, also in the second row. Since the latter coding included the terminal feedback for the particular reading error involved, the coder then skipped to the next row to prepare for any future errors. Another did occur, and again the teacher's first response was to repeat the question, as noted by the check mark in the repeat column in row three. Again the child did not know the answer, and this time the teacher asked another child to supply the word for the first child, as noted by the "2" in the asks other column in row three. This finished the coding for the second error, so the coder skipped to the next row to prepare for any future errors. An additional error did occur, and this time the teacher rephrased or gave a clue to the child about how to get the word, as noted by the check mark in the rephrase or clue column in row four. The child was able to supply the word himself after the teacher gave him the clue and the teacher affirmed that he had supplied the word correctly, as noted by the "2" in the affirm right column in row four. There were no further errors in the reading, but the teacher did give some process feedback to the child concerning his total reading performance at the conclusion of his reading turn, as noted by the "E" in the process column in row five.

The preceding illustrates both the way that the reading turns are to be coded and the way that the sequence of interaction can be recovered from the coding sheets. Each separate reading failure and its subsequent teacher feedback is separately coded, and the teacher's final comment at the end of the reading is identified as such (with the letter "E") so as not to confuse it with feedback regarding specific reading errors during the reading turn. Self-reference and work recitations are coded similarly, except that the child's identification number is in the appropriate column rather than in the reading turn column, as in the example in Appendix Two.

Any normal response opportunities that occur when the teacher asks a public question which is to be answered by a child are coded in the response opportunities section on the right side of the page. Such questions may occur during or in between reading turns, and may be directed at the reader or at other members of the group. In any case they are simply coded on the right side of the page in the same manner as they are coded on the general class activities sheet (Appendix One). Only the children's performance at reading and recitation per se and the teacher's specific feedback regarding this performance is coded on the reading and recitation section on the left side of the sheet. Response opportunities and individual teacher-child dyadic contacts are coded the same way on both sheets. Provision of space for coding these interactions on the same sheet which contains space for coding reading and recitation turns simply avoids the problem of having to switch back and forth between two separate coding sheets during reading and recitation turns.

The sole exception to the preceding statement that response opportunities are coded in precisely the same way on both sheets occurs with reference to the coding of type of question. On the general class activities sheet (Appendix One), the response opportunity is coded as a direct question, a discipline question, an open question, or a call out. The distinction among the first three types of response opportunities has been sacrificed in designing the coding sheet for reading groups, since experience has shown the coder to be much busier during this time and he has less time to reliably determine whether a

question is direct or open. In addition, the closer physical and psychological relationship between the teacher and the group in the small group situation as opposed to the general class situation frequently means that the teacher's designation of which child is to respond is frequently more covert and less obvious. This further increases the difficulty of reliably coding direct questions versus open questions. Consequently, it has been found convenient to not attempt to make these distinctions in coding a response opportunity occurring during reading groups. The response opportunity is simply coded as either teacher afforded or call out. Any response opportunity for which the teacher indicates which child he wishes to answer the question is coded as teacher-afforded; any response opportunity for which the child calls out the answer before the teacher has a chance to indicate a particular child to respond is coded as call out. As before, if the coder is unsure whether to code the response opportunity as teacher-afforded or as call out (because he is unsure about whether or not the teacher made some indication to the child that he should respond), the response opportunity should be coded as call out. Thus those response opportunities coded as teacher-afforded during reading and recitation groups will be those for which the coder is sure that the teacher did indicate to the child that he should respond before the response was made. Those response opportunities coded as call out will include both those instances in which the coder is sure that the child called out before the teacher had a chance to indicate anyone to respond as well as those situations in which he is unsure.

With the sole exception just described, response opportunities occurring during reading and recitation groups have the same meaning and are coded the same way as they are in general class activity. Consequently the data from the two coding sheets can be added together, unless investigators have some reason why they would not wish to do this. This is also true of the categories of dyadic teacher-child contact to be described below. Despite the differences in appearance (which are due solely to the need to conserve space on the reading and recitation coding sheet), these interactions have the same meaning and are coded in the same way on both sheets.

DYADIC TEACHER-CHILD CONTACTS

The preceding material has dealt primarily with the coding of response opportunities and reading and recitation turns. Description of the coding procedures involved has frequently been complicated because of the many distinctions to be made and the necessity for maintaining the sequence of events in the coding of the interaction. The coding of dyadic teacher-child contacts to be described below typically requires only the entry of the child's identification number in the proper place on the coding sheet.

Dyadic teacher-child contacts differ from response opportunities and reading and recitation turns in that the teacher is dealing privately with one child about matters idiosyncratic to him rather than publicly about material meant for the group or class as a whole. The latter distinction is the key one, since teacher-child dyadic contacts are not always private(the teacher may talk in a loud voice or address the child from across the room) [illegible] nevertheless coded as teacher-child dyadic contacts as long as they involve matters idiosyncratic to the child and are not public questions (response opportunities) or reading or recitation turns.

Dyadic teacher-child contacts are divided into procedural contacts, work related contacts, and behavioral or disciplinary contacts. They are also separately coded according to whether they are initiated by the teacher (teacher-afforded) or by the child (child-created). The coding also reflects certain aspects of the teacher's behavior in such contacts.

Work-Related Contacts

Work-related contacts include those teacher-child contacts which have to do with the child's completion of seat work or homework assignments. They include clarification of the directions, soliciting or giving help concerning how to do the work, or soliciting or giving feedback about work already done. Work-related interactions are considered child-created if the child takes it upon himself to bring his work up to the teacher to talk to him about it or raises his hand

or otherwise indicates that he wants to discuss it with him. Work-related interactions are coded as teacher-afforded if the teacher gives feedback about work when the child has not solicited it (the teacher either calls the child to come up to his desk or goes around the room making individual comments to the students). Created contacts are not planned by the teacher and occur solely because the child has sought him out; afforded contacts are not planned by the child and occur solely because the teacher initiates them. Separate space is provided for coding created and afforded work related interactions on the coding sheets, and the coder indicates the nature of an individual dyadic contact by where he codes the interaction.

In addition to noting the interaction as a work interaction and as an interaction which is child-created or teacher-afforded, the coder also indicates the nature of the teacher's feedback to the child during the interaction. He indicates this by using one or more of the five columns provided for coding teacher's feedback in work related interaction: praise (++), process feedback (pcss), product feedback (fb), criticism (--), or "don't know" (?). The first four of these categories have the same meaning as they have in other coding of teacher feedback. The additional "don't know" category is added for this coding because frequently the individual teacher-child interaction that occurs in the dyadic contacts will be carried on in hushed tones or across the room from the coder where he cannot hear the content of the interaction. In such cases, where he is unable to code the nature of the teacher's feedback because he cannot hear it, the coder notes the occurrance of the work related interaction and the fact that it was either teacher afforded or child created, but he enters the child's identification number in the "don't know" column (identified by the question mark on top). Coders should note that the "don't know" column has a very special and specific meaning for this coding. It should be used only when the coder cannot hear the teacher's feedback. It must not be used when the coder is unsure about whether to code the teacher's feedback as process or product. Thus, use of this column signifies that the coder could not hear the interaction, not that he has difficulty in making a coding decision on the basis of something that he

was able to hear. When a coder is unsure as to whether to code process or product feedback, he should code product feedback as in any other situation. Similarly, if he is unsure whether to code praise or criticism in addition to feedback, he should code only feedback, thus preserving the coded instances of praise and criticism to those cases in which the coder was sure of his coding. Thus, entries in the "don't know" columns will indicate solely that the coder could not hear the teacher feedback in the interaction involved.

Coding of work-related interactions according to the principles above is exemplified in the first few rows of the general class activities coding sheet in Appendix One. The number "11" in the feedback for created work related interactions in row one indicates that the child whose number is 11 approached the teacher to discuss his work and was given product feedback. Similarly, the "14" in row one under the feedback column for afforded work-related interactions indicated that the teacher initiated an interaction with child number 14 regarding his work and also gave him product feedback. Thus both of the preceding teacher-child contacts were work related and involved the teacher giving product feedback to the child. However, the contact involving child number 11 was initiated by him, while the contact involving child number 14 was initiated by the teacher. This difference is reflected in the placement of the two numbers on the coding sheet. Similarly, the number "9" in row three under the "don't know" column for created work-related interactions indicates that child number nine sought out the teacher to discuss his work but that the coder could not hear the interaction and therefore could not code the nature of the teacher's feedback.

The coding in the second row under created work interactions illustrates the procedure to be followed when the teacher's feedback includes more than one codable category. The placement of the number "13" indicates that child number 13 sought out the teacher to discuss his work and that the teacher responded with product feedback. The check mark under the "praise" column in the same row indicates that in addition to giving him product feedback the teacher also praised him.

In general, the first codable teacher feedback in created and afforded work related contacts will be indicated by the placement of the child's identification number. Any subsequent codable teacher feedback should be noted by check marks in the same row as the child's identification number. These teacher feedback responses should not be numbered consecutively, since in some cases this may produce confusion between these numbers and the identification numbers of the children.

The coding steps to be taken in the coding of work related contacts may then be summarized as follows: (a) the coder determines whether the contact is initiated by the teacher (afforded) or by the child (created); (b) the coder then determines that the contact is indeed a work-related contact and not one of the other types of teacher-child contacts; (c) the coder notes the teacher's response to the child or the feedback given to him and at this point enters the child's identification number under the appropriate column; (d) should the teacher produce additional feedback responses to the child besides that already indicated in the coding, the coder makes check marks in the appropriate columns next to the identification number of the child in the interaction involved.

Procedural Contacts

The category of procedural contacts includes all dyadic teacher-child interaction which is not coded as work-related contacts or as behavioral contacts. Thus it includes a wide range of types of contacts, most of which are initiated on the basis of the immediate needs of the teacher or child involved. Procedural contacts are created by the child for such purposes as seeking permission to do something, requesting needed supplies or equipment, reporting some information to the teacher (tattling on other children, calling his attention to a broken desk or pencil, etc.), seeking help in putting on or taking off clothing, getting permission or information about how to take care of idiosyncratic needs (turning in lunch money, delivering a note from his mother to the principal, etc.), as well as a variety of other contacts. In general, any dyadic interaction initiated by the child which

does not fit the definition of work-related contacts is coded as a procedural contact. Procedural contacts afforded by the teacher usually have to do with classroom management or with the teacher being aware of and handling some idiosyncratic need in the child. Examples include asking individual children to run errands, carry out a particular clean-up job, pass out equipment or supplies, and similar interaction in which the teacher enlists the child's aid in classroom management, as well as contacts initiated by the teacher to handle a particular situation idiosyncratic to the child involved (to see if he is sick or hurt, to give him a note to take home to his parents, etc.). In general, any dyadic interaction initiated by the teacher that does not fit the definition of work-related interactions or behavioral interactions is coded as a teacher-afforded procedural interaction.

As with work-related interactions, procedural interactions are separately coded on the coding sheets according to whether they are teacher-afforded or child-created. For afforded procedural interactions, the coder need only enter the child's identification number in the column headed by the term "procedure" in the space for coding teacher-afforded dyadic contacts. The numbers in this column on the general class activities coding sheet in Appendix One in the first rows indicate that the teacher approached child number 21, child number eight, child number 14, and child number ten during the coding for procedural contacts. In coding child-created procedural contacts, the coder indicates the nature of the teacher's response in addition to the child's identification number. Three categories for coding teacher's response are provided: praise (++), feedback (fb), and criticism (--). Praise and criticism have the same meaning here as elsewhere and are coded if they occur as part of the teacher's response. All teacher reactions to child-created procedural contacts which do not contain praise or criticism are coded as feedback. This means that a large variety of teacher reactions will be coded in the feedback category, reflecting the heterogeneity of types of procedural

contacts. Thus, coding of a created procedural contact with teacher feedback means that the teacher responded in some way to the child's expressed need or question without either praising or criticizing him. The numbers in the first rows of the created procedure dyadic contact columns in the general class activity sheet in Appendix One exemplify the proper coding of these interactions. In the first row, the number "16" under the criticism column indicates that child number 16 approached the teacher on a procedural matter and was criticized by him. The check mark in the feedback column next to the number "16" indicates that the teacher also gave some feedback to the child's need in addition to criticizing him. The criticism involved may have been due to the fact that the child left his seat to come and see the teacher, or it may have been connected with the particular procedural matter that the child took up with him. In any case, the coding indicates that the child did in fact approach the teacher on a procedural matter, that the teacher's first response was to criticize him for something, and that he also gave feedback regarding the procedural matter itself. The numbers in the next two rows indicate that child number 12 and child number 13 came to the teacher on procedural matters and were given feedback regarding those procedural matters without any teacher praise or criticism being involved.

Occasionally there will be difficulty determining whether a given teacher-child dyadic contact should be coded as work-related or procedural. Most confusion will be eliminated in this area if it is remembered that any questions or clarification about the directions for the assignment involved are coded as work-related, while questions having to do with equipment or supplies are coded as procedural. Thus, if the child asks the teacher to repeat the page numbers that he is supposed to complete in his workbook, asks if he should start the assignment right now or later, or has some other question regarding the immediate specifics of the assignment, the interaction is coded as a created work-related dyadic contact. On the other hand, if the child comes up to the teacher before starting his assignment because he needs a pencil, has run out of paper, or has some other problem with supplies, the interaction is coded as a created procedural dyadic contact.

Behavioral Contacts

Behavioral contacts are coded whenever the teacher makes some comment upon the child's classroom behavior. They are subdivided into praise, warnings, and criticism. The coder notes the information by entering the child's identification number under the appropriate column. Behavioral evaluation contacts are considered to be teacher afforded, although they usually occur as reactions to the child's immediately preceding behavior. Nevertheless, they are teacher-afforded in the sense that the child usually does not want and does not expect the interaction, and the teacher chooses to single the child out for comment. The conditions for coding this category are: (a) the teacher singles out the child for comment upon his classroom behavior; (b) the interaction concerns only his behavior and does not involve praise or criticism in connection with work-related or procedural contacts as defined above. Some behavioral criticism may occur in work-related and procedural contacts, and in those situations it appears in the coding for work-related and procedural interactions. The category of behavioral interactions is used only for those instances in which the teacher singles out the child for comment solely on the basis of wanting to discuss his classroom behavior. Work-related or procedural matters are not involved.

Praise

This category will be used relatively infrequently with most teachers, although it will occur. Occasionally children will be singled out for special praise when they have done a particularly good job of cleaning up their desks, sitting up straight, keeping quiet in preparation for leaving the room, etc. Praise coded in this category will also sometimes occur after activities but not in relation to specific responses during those activities ("Johnny really knew all his words today -- he must have studied real hard last night."). Idiosyncratic teacher euphemisms that carry the same sorts of meanings as the preceding examples are also considered to be praise ("Johnny has on his listening ears today," "Mary knows how to get ready to go."). Whenever the teacher singles out a child for such

praise, coders should enter the child's identification number in the praise column (++) under behavioral teacher-afforded contacts.

Warning

This category and the following one refer to teacher behavior in singling out for comment a child engaging in inappropriate or undesirable classroom behavior. Comments which function as warnings and which do not include elements codable as criticism are coded in the warning category, while negative reactions which do contain criticism are coded in the criticism category to be described below. Usually teachers' warnings will occur in situations in which the child is doing something that is not necessarily or always prohibited but which is troublesome at the moment. In such instances the teacher will single out the child to inform him that his present behavior is inappropriate, but will do so without communication of rejection or anger as in criticism. Examples of this are as follows: "Johnny, you're getting too noisy" "Try to figure out the answer on your own -- don't copy off your neighbor" "Johnny, you can talk to Mary if you want to, but stay in your seat."

The lines of demarcation between procedural-afforded interactions and behavioral warnings, and between behavioral warnings and behavioral criticisms, are sometimes difficult to discern. Examples are provided in Appendix Four. Sometimes the same or nearly the same words could be coded in either category, with the decision being made on the basis of the nonverbal expressive and gestural components of the teacher's message. Behavioral instructions given to the child merely in the interest of information or classroom management and without any connotation of warning or criticism would be coded as afforded procedural contacts. The same instructions given in a slightly different context which connoted more of a warning and perhaps implied that the child should know better ("John sit down -- Mary can't see when you stand up like that.") would be coded as behavioral warnings. If the same sentence were snapped at the child or delivered with anger or exasperation, it would be coded as behavioral criticism.

Coding of behavioral evaluation is exemplified in the final three columns of the general class activities sheet in Appendix One. The number "14" in the first row indicates that child number 14 was singled out for praise by the teacher. The number "16" and "17" in rows two and three indicates that the teacher delivered behavioral warnings to these two children; the appearance again of number "16" in the fourth row indicates that the teacher also later criticized the behavior of child number 16.

GENERAL CODING CONVENTIONS: VALIDITY

Certain general coding rules and conventions have been established which cut across all the coding categories and which may be relied upon for guidance in determining what to do in ambiguous situations. These conventions were established with particular attention to the problem of ensuring the validity of data in studies of teacher communication of expectations through differential behavior toward different students. However, many of them would apply with equal importance to any study using the present coding system. The basic general conventions are as follows:

1. Nothing is coded whenever the coder is not sure which child was interacting with the teacher. Do not guess about the identity of the child. This convention is important to avoid contamination of observation data by the expectations of the coder. Guesses about the identity of the children in ambiguous situations are likely to be influenced by the coder's expectations of which children would be likely to have the sort of dyadic interaction with the teacher that has just occurred. While this problem will occur rarely, it sometimes does happen that the coder is aware of a dyadic interaction but was not able to determine which child was interacting with the teacher. In these situations the occurrence of the dyadic interaction is ignored, and nothing is coded at all.

2. The teacher's intent or apparent intent is the single most important consideration for determination of proper coding when more than one category might apply. Thus, for example, if an ambiguous or even a correct answer is considered to be incorrect by the teacher, it is coded as incorrect in coding the child's answer. Similarly, the teacher may intend to ask one type of question but phrase it ambiguously so the child can respond to it in a different way. Consider the following example:

TEACHER: John, can you tell me how much is two plus two?
JOHN: Yes. (This child response is possible, although it occurs rarely.)
TEACHER: Well, how much is it?
JOHN: Four.

The preceding example and similar situations should be coded as single instances of product questions, not as self-reference questions followed by product questions. The rationale for this is that the teacher's intent was to ask a product question in the first place, and that he was forced to expand to a second question only because the child took advantage of the ambiguity of the question to give a self-reference answer to the original question. One should code these as single instances of product questions in order to faithfully reproduce the teacher's intent regarding provision of response opportunities to the particular child involved at this particular moment. Coding it as two separate response opportunities would in effect overestimate the teacher's intent to provide response opportunities to this child.

Teacher's intent must also be invoked to determine whether or not a question is really a question. That is, teachers may frequently ask rhetorical questions in which they do not expect the child to produce an answer. These are not considered to be questions and are not counted as response opportunities for the child, even if the child should overtly answer the question ("This ball is red, isn't it?"). On the other hand, choice questions similarly phrased which the teacher is treating as questions and which she expects the child to respond to are treated as questions and are coded under response opportunities. When the coder is uncertain the sentence should be treated as a statement rather than a true question, and no response opportunity is coded.

Coding of evaluative reactions also depends on teacher's intent, not on the child's reaction. Thus a teacher who verbally criticizes the child is coded for criticism, whether or not the child reacts to this criticism. On the other hand, a particularly sensitive child might overreact and become upset upon being given simple negation following a response. The fact that the child may react as if he has been criticized does not mean that the teacher is to be coded for criticism, since this is in fact not what he had intended or did in any objective way.

3. Coders should be thoroughly familiar with rules regarding the handling of ambiguous coding situations. For each borderline between related categories there is a rule stating what to do in situations in which the coder cannot decide between the two categories. These rules should be memorized and used universally so that certain categories can be kept "clean" and restricted to situations in which the coder was sure of his rating.

4. All teacher feedback reactions must be coded in the sequential order in which they occur. Consider the following teacher response to a correct answer: "Yes, John, very good." This teacher feedback statement, although relatively brief, requires two separate notations on the coding sheet. The teacher is coded first for affirmation of the correct response ("Yes, John") and second for praising the child's response ("Very good."). Thus in the same row corresponding to the child's answer there will be a check mark coded in the affirmation column and a "2" coded in the praise column.

5. The teacher-afforded and child-created dyadic interactions (work-related, procedural, or behavioral) are coded as single units if uninterrupted, regardless of how long they go on. This means that if the teacher should launch into an extended process review of the work with the child in a work-related dyadic contact, the coder nevertheless notes only one unit for an afforded or created work-related contact and only one unit of process feedback in that contact. Any codable teacher behavior during the contact is noted with the child's identification number or with a check mark, but it is noted only one time and repeated instances of the same type of behavior are not multiply coded. Similarly, in giving feedback to the child in an individual contact such as this the teacher might ask several questions as a way of helping him discover how to do the work. Such questions are occurring as part of the teacher-afforded or child-created work-related contact and therefore are not coded as response opportunities since they are not public questions. This convention may appear unwarranted or illogical at times, especially when a particularly long and noteworthy dyadic interaction is observed,

but it is consistent with the other facets of this measurement approach. To code more than one dyadic contact in such situations, or to attempt to multiply code the separate units of teacher behavior that might occur during a single unit, would be to introduce inconsistency that would dissipate the validity of frequency measures for the dyadic contact categories. For example, if difficulty in understanding the teacher produced longer average interactions and a greater number of teacher messages per interaction, the less-able child would be credited with a greater number of such interactions and/or a greater richness of interaction than would a child who was able to understand and more quickly incorporate the teacher's feedback. This is in a sense a special case of the more general principle mentioned above: The coding must reflect the teacher's intent and behavior rather than the child's response to it.

6. Occasionally unforeseen types of response opportunities or other classroom events will occur in which the coder is not sure whether to code the situation at all, or is not sure how to code it if he thinks it should be coded. In these situations the coder should code the interaction in whatever manner makes sense to him at the time, but he should be sure to indicate the units involved very clearly with a large "X" to the left of the coding sheet and he should at the first opportunity explain the situation in detail in the "remarks" section at the bottom of the page. These special situations should then be discussed with the project investigators as soon as possible (before the details are forgotten), so that determination can be made as to whether the data should be included in the study. In the present research this problem has come up with regard to games and other non-academic classroom activities. Recess, free play, and other obviously non-academic activities are not being coded. However, teachers will sometimes institute games which from some points of view may be considered academically relevant. In such situations the activities of the children may then be coded as response opportunities and/or recitation turns, with the special nature of the activity noted through placement of "X's" in the left margin and description of the activity involved in the "remarks" column. Determination of

whether or not to use these data is made later on the basis of whether or not the activity seems to involve enough elements of academic work to justify considering the response demands of the activity as response opportunities or recitation turns as defined above. If it is determined that the activity did not involve sufficient academic content to be comparable to the more clearly academic response opportunities and recitation turns, or if it is clear that the participation of the children was not under the control of the teacher (thereby making it not comparable with other coded activities), the data are excluded from the general analysis.

7. Praise and criticism are regularly coded teacher reactions, although there are many different columns and places for coding them, depending upon the context in which they occur. It is therefore important to avoid double coding these teacher behaviors. Frequently, in a teacher-afforded or child-created work-related contact, for instance, the teacher will not only criticize the work *per se* but go on to note that the work is poor primarily because of poor attention or other maladaptive classroom behavior. In one sense this criticism may be seen as behavioral rather than as work-related criticism. However, since it occurs during a work-related dyadic contact rather than in a contact initiated by the teacher solely to criticize the child's behavior, it is coded in the criticism column under work-related dyadic contacts (afforded or created, as appropriate). The coder does not make an additional coding in the criticism column for behavioral evaluations.

8. In coding response opportunities coders should be sure not to repeat the child's identification number when sustaining feedback is involved. This caution is necessary because in the present system the only method of obtaining an accurate count of original response opportunities is to count the number of times the child's number appears in the response opportunity coding sections. This total will ordinarily be smaller than the total for answers given by the child, since whenever sustaining feedback occurs a new answer will be coded and the original response opportunity will have led to more than one

answer from the child. Coders should also bear in mind that each response opportunity must be coded at the end for one or more types of terminal feedback. Be especially alert to check "0" in terminal feedback in situations where this is appropriate. This is easy to forget.

9. The design of the coding sheets is such that the need to enter information in the proper column is crucial, while the importance of rows is not, except for the fact that sequential information from the same response opportunity must be recorded on the same row. Interactions within each kind of dyadic contact (response opportunities, created work-related contacts, etc.) are simply recorded in the order in which they occur. The coder may skip rows if considerations of neatness or convenience dictate. When the space for coding any particular type of dyadic contact on a given page is used up, simply go on to a new page and code all dyadic contacts on the new page as they occur. As a general rule, it is better to use more coding sheets than to cause confusion or poor legibility by attempting to crowd the data onto the sheet being used at the moment.

INSTRUCTIONS FOR USING THE CODING SHEETS

Although the basic coding procedures have already been described above, some additional data must be entered on the coding sheets for information retrieval and bookkeeping purposes. Both coding sheets contain spaces for identification information at the top of the page. These include the code number for the classroom being observed (using whatever system the investigators prefer), the date of the observation, the time span involved (using the classroom clock), the nature of the school activity involved at the beginning of the observation, the number of children in attendance that day, the observer's initials, and the page number.

The class code must be entered correctly; this is important as this will be the only means of identifying the information. The class code number, the date, and the page number should be entered on each page of every observation, so that should they come apart from one another they can be recollated in the proper order later. All three items of information are required in order to place each coding sheet in the proper time sequence.

The start, stop, and elapsed time data are based on the classroom clock if it is properly functioning. Otherwise coders should syncronize watches and use them. The start time listed at the top of the page is the time at which the observer begins coding; the stop time is the time when he stops coding. The elapsed time is simply the difference between these two time notations. On the reading and recitation coding sheets (Appendix Two) the time data will refer to beginning, duration, and end of the reading group or other group activity, since these are self-contained group activities. Thus the elapsed time here will be 15 or 20 minutes. For the general class activities sheet (Appendix One) the start time is entered on the initial sheet and the stop time is entered at the end of the day's observation, which may appear several sheets later. This is later copied back onto the first sheet and the elapsed time is determined.

On the general class activities coding sheet several intermediate stop times will have been recorded on the left side of the coding sheet. The time is noted whenever a focal activity ends, so that the stop time for one activity is also the start time for the following activity (although the following activity will often be a transition

period). The first activity to go on at the beginning of the observation period is entered at the top of the page on the line labeled "activity." The start time listed at the top of the page therefore will correspond to the start time for this activity, or at least the start time for coding of this activity if it had already started before the coder began coding. When the first activity ends, the stop time is noted on the left side of the page under "stop time" and a line is drawn horizontally across the page underneath all coding which has been entered on the page so far. This is exemplified in Appendix One in which the first activity (labeled "morning routine") began at 8:30 (start time) and it continued until 8:46 (stop time). The coder noted the stop time at the left side of the page and then drew a line across the sheet underneath the coding which had occurred during the "morning routine" activity. He then noted that a transition period occurred which lasted until 8:49, noted also under the "stop time" column. He then drew another line across the page to indicate the limits for coding within the transition period from 8:46 to 8:49, and then noted that the following consisted of a reading group for part of the class and seat work for the other part, lasting until 9:09. No coding appears on the general class activities sheet during the reading group periods (8:49 to 9:09; 9:13 to 9:32), since these activities would be coded on the reading and recitation group coding sheet.

The preceding exemplifies the coding procedures for marking time and activity type. As an activity comes to an end the coder notes the <u>stop time</u> and draws a line across the page. He then notes the nature of the new activity and continues coding until it comes to an end, at which point he again notes the stop time and draws a line across the page. In this manner the beginning and elapsed time for each of the various activities identified in the investigation are noted on the coding sheet, and later analysis can be performed if there is interest in the relative amount of time spent in different activities or the types of interactions which tend to occur in different types of activities.

In the present research observation periods extend for an entire morning or an entire afternoon, with an equal amount of each being included in the data for each classroom. This strategy was adopted to ensure that the full range of classroom activities would be included in the research data. For other research purposes it may be advisable to restrict observation to particular types of activities (such as reading groups), to observe for shorter blocks of time, or to adopt some other procedure. Determination of what does and does not need to be coded concerning time units and types of activities involved must be made on the basis of the interests of the investigator and the validity considerations involved in collecting the data required in the particular research.

For the present research, the following types of activity levels are used:

(a)	Morning routine:	Getting settled into seats, pledging to the flag and/or singing songs, presenting information concerning the day of the week and the date, passing out seat work or noting workbook assignments for the day on the board, and other daily routine events. These may vary considerably from teacher to teacher, but most teachers do tend to have a "standard operating procedure" for beginning the daily routine.
(b)	Reading groups:	Formally organized subgroups for the purpose of oral reading and group work on reading related skills.
(c)	Subject-matter lesson:	(Specify subject) Teacher conducts a lecture-demonstration or discussion lesson in academic subject matter such as word recognition, arithmetic, science, spelling, etc. Most response opportunities coded outside of reading groups will occur in these activities.
(d)	Show and tell:	Children take turns presenting self-reference material to class.
(e)	Story reading:	Teacher reads to children. This should not be confused with reading groups, in which the children read themselves.
(f)	Recess or play activity:	Children engage in an activity meant solely for recreation and/or physical education. No coding is done during these activities in the present research.

(g) Transition: Short periods in between organized activities, in which the teacher is supervising the transition from one to the other. During this time he may be telling children to put away or get out materials from the old or the new activity, dealing with individual problems of particular children, preparing materials to be used in the subsequent activity, etc. A transition period between reading groups, for instance, would begin when the teacher tells the first group to go back to their seats and extend until he begins the organized reading group activity with the second group. The time between the end of the last organized activity for the morning or afternoon and the actual leaving of the room by the class is also considered to be a transition period.

In the present research coding is done continually during the entire morning or afternoon with two exceptions: (a) no coding at all is done during play group or recess activities; (b) during the final transition period at the end of the morning or afternoon, when the teacher and class are getting ready to leave the room, only behavioral evaluations by the teacher are coded. The former procedure simply reflects the present investigators' desire to concentrate on teacher and child behavior in academic activities. The latter rule was adopted to avoid coding the idiosyncratic types of procedural dyadic contacts that tend to occur at the end of the morning or afternoon. During this time many of the children will come to the teacher with procedural matters that involve such things as assistance with clothing, getting their lunch box or lunch money, seeking permission to leave and pick up a younger sibling, etc. The majority of procedural contacts occurring at this time have to do with personal matters other than classroom activity-related procedural considerations. For this reason it was decided to not code them, thereby keeping the preponderance of codes in the procedural contact categories confined to interactions which occurred while the class was engaged in academic activity and which bears some relationship to the academic aspects of the student role.

Attendance

Coders should form the habit of taking and noting the attendance immediately at the beginning of coding, since it is easy to forget to do otherwise. For the general class activities coding sheet (Appendix One) attendance refers to the number of children present in the entire class for that day. For the reading and recitation sheet (Appendix Two) attendance refers to the number of children present in the group that day. After recording the total number of children present, the coder should enter beneath this number the identification numbers of any children who are absent that day. In Appendix One for example, it is noted that 23 of the 25 children in the class were present on the day of the observation, but child number 3 and child number 7 were absent.

Other Information

The coder should enter his initials at the top of the page in the line provided and also note the page number and the total number of pages for the observation. This information will be useful later in collating the coding sheets if they should come apart. The reading and recitation coding sheet also contains the space for identification of the reading group involved. In the present research the groups are numbered consecutively beginning with the highest achieving or most advanced group. Thus the phrase "reading group one of three" would refer to interaction taken from the highest reading group (group number one) in a class that contains three reading groups.

Expectation

The expectation space on the coding sheets is used in the present project to record verbatim teachers' communications to individual children or subgroups which are noteworthy examples of communication of performance expectations. This is not part of the formal coding in the present research since the verbalizations involved are not objectified or operationally defined as are those in teacher feedback. The space is included primarily to provide the coder with an opportunity to record some of the particularly striking or noteworthy communications of expectation which are missed by the coding system or which contain an instructive richness which the coding system does not faithfully maintain. When coders encounter such a situation they are asked to

record the teacher's verbalization and the identification number of the student or the nature of the subgroup of students to which the verbalization was addressed. In this way, it is possible to collect a pool of examples of the ways in which the teachers communicate differential performance expectations in addition to those being tapped directly in the coding system. Many of the examples included are statements made to groups, such as reading groups, rather than to individuals ("All of you in the red group should know these words by now."; "I'm surprised at how well the blue group is doing today."). These examples are useful for showing how teacher expectations are translated into behavior and they provide material for case studies of individual students or subgroups. In addition, teacher behavior initially noted in the expectation example spaces which appear frequently enough and are sufficiently operationally definable to be reliably coded can be added to the coding system.

Remarks

The remarks section at the bottom of the sheet should be used by the coder to communicate any information that he thinks is important or worth noting. Anything unusual about the classroom activity during the coding time should be noted, particularly if the activity somehow differs from the activities anticipated and provided for in constructing the coding system. When this occurs the validity of the coding might be impaired (i.e., the various codes might not mean the same thing and be amenable to the same interpretations as they are ordinarily). This most commonly occurs in games and other non-academic activities which do not easily fit into the "self-reference recitation" category. As noted previously, in such situations the coder should code the interaction if he is unsure as to whether or not it is codable, but he should note the units involved with an "X" in the left margin and should explicitly and comprehensively explain in the remarks section the nature of the activity involved. Discussion of the situation with the project investigator should be done as soon as possible after the data coding so that the decision as to

whether or not the data should be retained in the analysis may be made before the details of the situation are forgotten. Coders should use the remarks space liberally; in view of the importance of maintaining the validity of the data it is better to err on the side of over- rather than under-inclusiveness in recording details about unusual or unanticipated classroom events.

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Good, T.L. and Brophy, J.E. "Do Boys and Girls Receive Equal Opportunity in First Grade Reading Instruction?" Report Series No. 24, The Research and Development Center for Teacher Education, The University of Texas, Austin, Texas, 1969.

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APPENDIX ONE

General Class Activities Coding Sheet

1. Class 3 2. Date 9/27/69 3. Start 8:30 4. Stop 11:20 5. Elapsed 170

6. Activity MORNING ROUTINE 7. Attendance 23 3,7 8. Observer JB 9. Page 1 of 3

STOP TIME	RESPONSE OPPORTUNITIES: CHILD Discip	CHILD Direct	CHILD Open	CHILD Call	QUESTION Pcss	QUESTION Prod	QUESTION Choice	QUESTION Self	ANSWER +	ANSWER +-	ANSWER -	ANSWER NR	TERMINAL FEEDBACK ++	TERMINAL FEEDBACK Affirmt	TERMINAL FEEDBACK 0	TERMINAL FEEDBACK Negrotng	TERMINAL FEEDBACK --	TERMINAL FEEDBACK Pcss	TERMINAL FEEDBACK Giv Ans	TERMINAL FEEDBACK Ask Oth	TERMINAL FEEDBACK Call	SUSTAINING Rept	SUSTAINING Reph or Clue	SUSTAINING New Q	CREATED WORK ++	CREATED WORK Pcss	CREATED WORK FB	CREATED WORK --	CREATED WORK ?	CREATED PROCEDURE ++	CREATED PROCEDURE FB	CREATED PROCEDURE --	AFFORDED WORK ++	AFFORDED WORK Pcss	AFFORDED WORK FB	AFFORDED WORK --	AFFORDED WORK ?	Perdoucre	BEH ++	BEH W	BEH --
																										11					✓	16			14			21	14		
		7				✓			✓				2	✓											✓		13				12							8		16	
		6				✓						✓										✓							9		13							14		17	
						✓					✓					✓							2															10			16
8:46							✓		✓					✓																										
TRANSITION																																								
																																					13			
8:49																																					19			
READING GROUP #1, SEATWORK 9:09																																								
																																					13		16	
TRANSITION 9:13																																					6			
READING GROUP #2, SEATWORK 9:32																																								

Expectation:

Remarks:

APPENDIX TWO

Reading and Recitation Turns Coding Sheet

1. Class 3 2. Date 9/27/69 3. Start 8:49 4. Stop 9:09 5. Elapsed 20

6. Reading Group 1 of 3 7. Attendance 9 8. Observer JB Page 1 of 2

READING AND RECITATION

CHILD			TERMINAL FEEDBACK									SUSTAIN		
Self	Work Rec	Read Turn	+ +	Affirm Right	0	Neg Wr	- -	Pcss	Gives	Asks	Call Out	Rept	Repl or Clue	New Q
		16		E										
		17							2			✓		
										2		✓		
				2									✓	
								E						

RESPONSE OPPORTUNITIES

QUESTION				CHILD		ANSWER				TERMINAL FEEDBACK									SUSTAINING		
Pcss	Fed	Choi	Self	Afforded	Call Out	+	+ -	-	NR	+ +	Affirm	0	New Wr	-	Pcss	Asks	Call	Rept	Repl or Clue	New Quest	

CREATED PROCEDURE: ++ FB --

Afforded Work: + P - + cs b - ?

AFFORDED BEH: Procedure | + W -

Expectations:

Remarks:

APPENDIX THREE

Additional Variables Not Included in the Present System

Listed in this appendix are a number of other variables which can be coded with the same methodology used in the present system. These variables have been excluded from the present system because they are less relevant to the study of communication of expectations and/or because of practical considerations concerning the cost or difficulty of coding them.

Chorus Questions

Chorus questions are coded when the teacher encourages or passively allows the class to call out the answer to his question. He does not direct the question to a specific individual child or make it clear that the children are to raise their hands and get recognition from him before responding. In such situations more than one child will call out an answer, and the teacher's feedback reaction will be directed to the class as a whole or at some subgroup rather than to an individual student. Thus the teacher provides each student with a response opportunity but does not individually monitor their responses or provide individual feedback. The children respond and are reacted to as an undifferentiated chorus. This technique is frequently used in the early elementary grades when the teacher is conducting a drill over previously learned material. It affords the children response opportunities of sorts, since they call out answers, but since it does not involve individual monitoring and feedback it usually does not lead to detection and correction of errors. In addition, the question is usually a low level product question or a choice question which requires a one-word answer. The questions and answers tend to pass very quickly, so that the educational impact of a single chorus question is probably very limited.

Occasionally a question will start out to be a chorus question but will result in the teacher interacting dyadically with an individual student who happens to be the only one to call out an answer or to answer the question correctly. In such situations call out should be coded if the student receives individual feedback from the teacher.

Hand Raising

During periods of questioning the hand raising behavior of the children may be coded as a measure of their tendency to seek response opportunities. This most usually occurs during open questions, although it may happen during direct questions if the child designated to answer the question is having trouble so that the other children raise their hands in an attempt to get a chance to do better. The criterion used for coding hand raising is that the child must raise his hand before the teacher calls on somebody else to answer the question. Hand raising not noted by the teacher is nevertheless credited if it occurs before the teacher calls on someone to respond, since the teacher presumably would have noticed it and could have called on the child if he had turned his head. Hand raising occuring after the teacher calls on someone is not credited, however.

In open question situations it may also be desirable to code whether or not the teacher called on someone who had their hand up to answer the question. The teacher who calls on a child who has not raised his hand in such situations is exerting some pro-active control in equalizing response opportunities, while the teacher who rarely or never does so is allowing himself to be manipulated by the children.

Hand raising behavior was not included in the present system because of practical considerations. One coder could not handle an entire classroom if he had to code hand raising in addition to all of the other variables in the system, or indeed if he had to code hand raising by himself. Accurate coding of hand raising requires several coders if the entire classroom is to be coded, since a single coder can only monitor a few children at a time if he is to code this behavior accurately. Three or four coders instead of one would have been required if this data were to be gathered for every child in each classroom studied. Fortunately, much of the information contained in the measures of hand raising behavior is duplicated or highly correlated with other measures which are included in the system. Thus the number of times that a child is coded for an open question (which means that he had his hand up) and the number of times that he seeks out the teacher for a

work related contact are indexes of the child's tendency to create response opportunities. At the same time the measures of direct questions and of teacher afforded work related contacts provide estimates of the teacher's tendency to exert control over the frequencies of work related contacts with individual children.

Aspects of the Children's Answers to Teacher Questions

In the present system the children's answers are characterized as correct, partially correct, incorrect, or no response. For some purposes it may be important to code other aspects of the children's answers. Latency is one such aspect. In situations in which the child does not immediately begin to give an answer to the question, it would be instructive to know the number of seconds of elapsed time before the teacher intervenes with a feedback reaction. Long latencies would suggest a confidence in the child and a willingness to wait for him to respond, and would be expected to correlate with a preference for sustaining feedback over terminal feedback in such situations. Certain aspects of the child's behavior in such situations which may affect the teacher's response are also of interest. In the "no response" situation, for instance, it would be instructive to record whether the child quickly indicated that he did not know the answer (in a straight forward or even flippant manner) or whether he instead made no response (and perhaps avoided eye contact with the teacher and communicated anxiety or shame). In situations in which the children give partially correct or incorrect answers, it would be of interest to code separately those answers which proceed from acceptable or even optimal processes but are wrong due to mistaken premises or inference ("honest" mistakes) and those responses which appear to be blind guesses.

Other Variables

The basic research methodology for coding dyadic teacher-child interaction adopted in this manual can be extended to the study of almost any kind of behavior. Behaviors chosen for study in the present research are heavily concentrated in the academic area, since the manual is being used to study teacher communication of performance expectations. Many additional types of coding could be done by making

finer differentiations in behavior which is not differentiated with the present system (separating rephrasing of questions from clues, for example) or by extending the system to include behavior not presently subsumed within it (events occurring during play periods and recess). In addition, many presently existing classroom interaction analysis systems which are not ordinarily applied dyadically can be so applied. Usually this will involve applying the system the same way it is always applied except that data are recorded separately for each individual child when the teacher is interacting dyadically.

When extending the system to include new variables investigators should make provision to insure preservation of sequential aspects of the data which may be necessary if the data are to be interpreted unambiguously. It should always be noted, for instance, whether the interaction was initiated by the teacher or by the child. Other information about the preceding or instigating events may also be necessary, as in the question-answer-feedback sequences coded in the present system.

In investigations of intra-class group differences in the quality or quantity of interactions with teacher, investigators may wish to record teacher behavior directed at groups in addition to that directed at individual students. Examples include reading groups, table groups (children seated at the same table), boys, girls, ethnic groups, racial groups, etc. To the extent that the teacher recognizes and tends to interact towards the members of a group <u>as a group</u>, opportunities for coding differential treatment of different groups within the same classroom will be available. In such cases researchers might want to extend the system to make provision for statements made <u>to</u> groups <u>about</u> the groups ("John's reading group should know the answer to this question"). Such statements would not be coded in the present system, since they do not occur in the context of dyadic interaction directed at a single child (although they should be noted in the "expectations" space at the bottom of the coding sheets).

APPENDIX FOUR:

Coding Examples

RESPONSE OPPORTUNITIES

Response opportunities are dyadic interactions since they occur between the teacher and a single child at a time, but they are also public interactions meant for and attended to by the entire class or the entire group operating at the moment. The public aspect separates response opportunities from the procedural and work-related dyadic interactions which often contain teacher questions but do not require a public response.

Response opportunities must also be distinguished from reading and recitation turns. Here the distinguishing criterion is not the public nature of the response (since both are public), but the type of response demanded. Response opportunities involve a single question that demands a fairly circumscribed answer (who, what, where, when, why, how much, how many, etc.). Reading and recitation turns, in contrast, require the child to respond at length, demonstrating an over-learned knowledge or skill (reading a text, reciting mathematical tables, reciting poetry or other memorized verbal material, or any other lengthy presentation of memorized material). A response opportunity involves only a single response (although this may become quite complex in some process responses), while the reading and recitation turns involve extended presentations made up of several discrete responses, each of which can be judged in isolation from the others and can elicit specific feedback from the teacher (especially if the child makes a mistake). Any time the response demand on the child does involve an extended series of discrete responses that could elicit separate and specific teacher feedback, the interaction should be coded as a reading or recitation turn and not as a response opportunity. This is true even if the teacher makes a feedback reaction only at the end of the response. The criterion is the type of response demand, not the teacher's behavior. Reading and recitation turns are coded whenever the response involves discrete units which could elicit specific teacher feedback, whether or not they actually do.

Occasionally a unitizing problem will come up in determining whether or not to code response opportunities or how many to code. Consider the following sequence:

Teacher: "John, what's the little girl's name in our story?"

John: no response

Teacher: "Mary, do you know what's the little girl's name?"

John: (before Mary can even answer) "Sally!"

Teacher: "That's right, John."

The preceding sequence shows the teacher asking John a product question and getting no response. The teacher then moves to another child to ask the same question, but John comes up with the answer before the second child can say anything. The teacher then gives a feedback response to John. This would be coded as <u>three separate response opportunities</u>. The first would be a product question to John, to which he makes no response, with the teacher's feedback coded as <u>asks other</u>. Then a product question would be coded for Mary, with the child's answer being coded as no response also and with the feedback being coded as <u>call out</u>. The third coding would also be a product question (the same question all along) but with John being coded for a <u>call out</u> response (since the question was not now directed to him), with his answer coded as correct, and with the teacher's feedback response coded as affirmation of the correct answer. The coding for this example illustrates also the use of the teacher's intent as the primary criterion for making coding decisions. The sequence is broken into three separate response opportunities on the ground that the teacher intended to provide an initial response opportunity to John; that he then provided a separate response opportunity to Mary when John could not come up with the answer; that John created an additional response opportunity for himself by calling out the answer and getting a feedback response from the teacher (this second response opportunity for John would not have been coded if the teacher did not recognize his response and make a feedback reaction). Thus the sequence includes two response opportunities deliberately given by the teacher and one created by the child's call out which is sanctioned by the teacher when he gives a feedback response.

The following example illustrates the criterion of a <u>public</u> response: Each child in a reading group has a work book in his lap and the teacher tells them to draw a line from the picture of Dick to the picture that shows his pet. The teacher then looks around the group

to see if everyone is marking correctly. He turns to one child and says (privately) "Paul, show me with your finger where the line should go." Since this is a private interaction it is coded as an afforded work-related interaction rather than as a response opportunity. If instead the teacher had asked Paul to come up in front of the group and demonstrate where the line would go so that the other children could see, the interaction would be coded as a response opportunity.

In reading groups, response opportunities frequently will be interspersed within reading turns. This should cause no confusion if coders keep in mind the distinctions between the two types of responses. The child's performance when reading aloud to demonstrate his ability to read the material for the teacher is coded as a reading turn, and any mistakes he makes during his reading turn and the teacher feedback (if any) in connection with them are coded in the reading turn section of the coding sheet. During or after such reading the teacher may ask questions that require the child or someone in the reading group to show understanding of the material that was read ("Why did Dick run home?" "What's the dog's name?"). These are coded as response opportunities and not as part of the reading turn, even when asked of the child who is presently reading. Should the teacher ask the child who has been reading or some other child to paraphrase or summarize the entire story, this child will be coded for a recitation turn. It would not be a response opportunity since the response involved can be divided into several discrete subunits which could elicit specific teacher response, and it is not a reading turn since the child is not asked to demonstrate any reading skill. Instead he is asked to tell the story from memory. This will be coded as a recitation turn, and the coder should note the exact nature of the response in the "remarks" space at the bottom of the coding sheet.

TYPE OF RESPONSE OPPORTUNITY

Discipline Questions

Discipline questions should be coded only when the coder is sure that the teacher called on the child deliberately because of innattention. Ordinarily this will mean direct evidence in the teacher's comment:

"I know you don't know -- you weren't listening."
"If you kept the place, maybe you'd know."
"You've got time to fool around, but you can't do the work."

Discipline questions would ordinarily not be coded without such verbalization of the teacher's intent. However, it is permissible to code discipline questions if the coder observes striking non-verbal evidence (the teacher stares at length at a misbehaving child who is unaware of this attention and then calls on him to answer a question). In general, however, coders should code discipline questions only when they are certain, coding the interaction as a direct question otherwise.

Direct Questions

Direct questions are coded whenever the child is given a response opportunity which he has not sought by raising his hand or otherwise indicating a wish to respond. The most obvious cases occur when the teacher names the child before asking the question ("John, how much is two plus two?"). However, anytime the teacher calls on a child who is not raising his hand or otherwise indicating a desire to respond, her question is coded as a direct question. There should be no problem in coding this unless the coder had not been observing the child who was called on before the teacher called on him. In such cases, when the coder is unsure as to whether or not the child was raising his hand, the coder should code the interaction as an open question, thereby restricting the coding of direct questions to instances in which he is sure that the teacher called on a child who was not seeking a response opportunity.

Open Questions

Open questions are coded when the teacher asks a question, waits for one or more children to raise their hands or to otherwise indicate a desire to respond, and then calls on one of the children who are seeking a response opportunity. Should he call on one of the children who is not raising his hand or otherwise indicating that he is not seeking a response opportunity, the interaction would be coded as a direct question rather than as an open question. The criterion is simply whether or not the child called on was raising his hand or otherwise indicating a desire to respond when the teacher called on him. Consider the following sequence: The teacher asks a question,

waits for raised hands, and then calls on one of the children who had his hand up. All of the children then put their hands down. The child who was called on cannot answer the question appropriately, so that the teacher then calls on another child. This second child had his hand up originally when the teacher asked the question, but he does not have his hand up at the moment that the teacher calls on him, having put it down when the first child was called on.

In this sequence the first child would be coded for answering an open question, since he was indicating a desire to respond when the teacher called on him. The second child, however, would be coded for a direct question, since when the teacher called on him he was not indicating a desire to respond. Had the second child kept his hand up, or had he raised it again when he saw that the first child was not answering the question correctly, his interaction with the teacher would also have been coded as an open question.

Call Outs

Call outs are coded when two conditions are met: (a) a child who has not been designated to respond by the teacher calls out an answer to the teacher's question: (b) the teacher then turns his attention to this child and makes a feedback response specifically to him.

Confusion over the first condition may occur when the teacher uses minimal cues in designating who should respond to his questions. The rule regarding coding indecision on this matter is a follows: if the coder does not know whether or not the teacher designated the child to respond before he called the answer, he should code the interaction as call out rather than as an open question, since this implies less about the teacher's intent. However, when coding in the classroom of a teacher whose style does involve calling on children by nodding at them, pointing at them, etc., rather than by calling out their name, the coder should be especially alert to observe the teacher's behavior in order to minimize the number of times that he codes call out due to indecision rather than to clear observation.

Application of the second condition (the teacher must respond specifically to the child who calls out an answer) sometimes causes confusion for new coders. Coders should bear in mind that the key criterion is that the teacher response is specific and directed individually to a single

child. The teacher's response need not be particularly intense or prolonged -- it may be confined to a simple affirmation or negation. However, it must be directed toward the individual. Thus if several children call out an answer to the teacher's question, call out may or may not be coded depending on the teacher's reaction. If two or more children call out the same answer and the teacher gives a reaction to the group rather than to an individual, nothing is coded. This is true even if he names the individuals by name. However, if the teacher turns to one individual from the group that called out an answer (or if only one individual called out an answer) and if he makes a codable feedback response to this individual, a response opportunity is coded as a call out for that individual child.

Occasionally there will be quick-moving drills in which the teacher is pressing for short answers in previously learned material. In such cases the teacher may move quickly when the correct answer is called out and pause only when the group has a difficulty. Sometimes the teacher may even be more concerned about eliciting the answers than about who is giving them, and he may respond with no feedback or with a minimal affirmation ("Okay") when a right answer is elicited and quickly move on to another question. Call outs would not ordinarily be coded in such situations, even if only one child called out the right answer, unless the teacher takes the time and trouble to direct a feedback response to the individual child involved. The teacher need not call the child by name ("That's right, John"), but he should at least look directly at the child when giving feedback.

Application of the condition requiring the teacher to make a single specific response to a child who calls out an answer will mean that the teacher feedback response category no feedback will ordinarily not be used in connection with the response opportunity category call out. There is one way in which this can occur, however, although it will rarely appear. The teacher may respond to a specific child who has called out an answer by indicating that he has heard and understood his response but at the same time avoiding giving any specific feedback about its correctness or incorrectness ("You think there are six?"). In this case the child involved would be coded for a call out response opportunity, since the teacher did make a specific reactive response to

his answer. However, if the teacher's feedback response was confined to that given in the example, it would be coded as no feedback.

When the teacher reacts to a call out by criticizing the child but does not give feedback to the content of his answer, no response opportunity is coded; instead, the teacher is coded for a behavioral criticism of the child involved.

LEVEL OF QUESTION

To determine the level of the response demand built into teacher's questions the coder must make two decisions: (a) he must decide whether the question is an academic question or a self-reference question; (b) if it is an academic question he must determine whether it is a process question, product question, or choice question. Academic questions concern factual matters connected with curriculum content of the school. They require the child to make a response showing that he has certain knowledge of information, to provide such information himself in answering the question, or to explain something at length showing his grasp of the principles involved. The content of the question deals with reading, writing, arithmetic, social studies, science, spelling, or other aspects of curriculum which the school is attempting to deliberately teach the child. Questions dealing with these matters are considered academic questions and subdivided into process, product, and choice questions. Questions that do not deal with such factual matters but instead ask for the child's opinions, preferences, predictions, personal experience, and so forth are coded as self-reference questions. These are not differentiated into process, product, and choice questions but are simply coded in a single category ("self-reference questions").

Process Questions

Process questions require the child to explain at length the cognitive or behavioral processes to be gone through in solving a problem or producing the correct answer to a question. They cannot be answered with a single word or a short phrase as is the case with product questions.

Examples: What can we learn from this story?
What does that saying mean?
Why should we not play with matches?
How do new plants grow from old ones?
Why does it get dark at night?
How do you know that that's a long "e" sound?

Why is that a wrong answer?
What should you do if . . . ?

As always, the teacher's intent determines the coding. For example, the teacher may ask "When you ride your bike and come to a stop sign, what do you do?" Ordinarily this would be coded as a product question demanding the answer "Stop." However, if the question appears just after a lesson in which the teacher had explained the process of stopping (stop the bike, carefully look right and left, judge the distance of any cars in sight, and quickly get to the other side, etc.), this question would be coded as a process question. This example illustrates the procedure to be followed when in doubt in determining whether a question should be process versus product. If the teacher seems to be requiring a process answer, that is a long explanation of a complex sequence of events, process question should be coded. If on the other hand he seems to be satisfied with a simple short answer, product question would be coded.

Product Questions

Product questions seek a specific correct answer which can be expressed in a single word or short phrase. They do not involve the explanations built into process questions, and at the same time they do not provide the child with alternatives which include the correct answer, as in choice questions. Thus the child must either know the answer and verbalize it or take a guess by encoding an answer on his own.

Examples: What (letter, number, day, shape, color, etc.) is this?
Who (discovered America, is the president)?
What is this?
When (is Christmas, was America discovered, etc.)?
Where (is Boston, do we buy food, etc.)?
What do we get from cows?
How many _____ are there?
How do you spell _____?
What do buses do?
What is this word? (a question requiring the child to read a single word is coded as a product question rather than as a reading turn, which involves reading at length)

The following example occurred during a reading group: The teacher gave each child a card with a word on it and then told the children, each in turn, to read their word and then place it under the picture that it matched. This was coded as two separate response opportunities for each child; the first one being a product question (read the word), and the second being a choice question (match the word to one of the pictures).

In discussing stories or pictures there sometimes will be difficulty in distinguishing product questions from self-reference questions. As always, coding must follow the teacher's apparent intent. Thus if the answer to the question is to be found by examining the picture (What color is Sally's wagon?), the question is coded as a product question. On the other hand, if the teacher is not asking for a factual answer but wants to get opinions on what the children think might happen (What's Dick going to do now?), a self-reference question is coded. In general, if the teacher is fishing for the right answer he is asking a product question; if he is instead only trying to get the children to express their opinions or to talk about the picture, self-reference questions are coded. Sometimes the teacher will begin with a product question and, seeing that he isn't going to get the answer, will continue to ask various children what they think will happen, etc., so that the remainder of the questions will be coded as self-reference questions.

Choice Questions

Two criteria distinguish choice questions: (a) the question deals with academic content and cannot be classed as a self-reference question; (b) the teacher provides response alternatives, either verbally or by showing the child visual aids to look at in connection with the question, which include the correct answer among them (ie., the correct answer is one of the alternatives presented). Examples:

Is this (b or d, 3 or 4, Monday or Tuesday, a square or a circle, red or blue)? (either-or questions)

Which of these is (taller, smaller, blue, a vowel, the same as this one, etc.)? (select the right answer from among the alternatives presented)

Are these (the same, blue, circles, synonyms, correct, etc.)? (Yes-no questions)

Which four of these five things go together? (the child must pick four pictures but nevertheless the correct answers are provided in the alternatives shown)

The big bear sat on a brown box. Which words start with the same letter? (although more difficult, this is still a choice question in that the alternatives are provided in the question itself)

Look at the color words on the black board. Which ones start with the letter "b"? (Again, the correct answers are included in the alternatives presented. If instead the children were expected to pull these from memory (What color words start with the letter "b"?) without any reference to concrete examples of color words, the question would be coded as a product question.)

Make an X on all the animals that have a tail. (Any workbook or worksheet exercise which involves marking one or more of a set of alternatives according to some rule is treated as a choice question, since all the alternatives are provided.)

Coders should bear in mind that any question which is an either-or question or a yes-no question is coded as a choice question, regardless of the complexity of the content. Examples:

If I pour the water from this white dish into this test tube, will there be more water, less water, or just the same amount?

Are the lines of a rectangle equal and parallel, equal but not parallel, or parallel but not equal?

Which is better to put out a grease fire -- water or sand?

Although the preceding examples are apparently complex, it nevertheless remains possible for some children who do not understand the processes involved to be able to respond to the question, since the response alternatives are provided in the question itself. Thus should the child decide to respond rather than say that he doesn't know or ask for more information, he can respond by verbalizing one of the response alternatives back to the teacher.

Sometimes a question which would ordinarily be classified as a product question is coded as a choice question because of the immediately preceding events. The previous example "What color words start with 'b'?", for instance would be classified as a choice question if the teacher had preceded it by calling the children's attention to concrete examples of color words (by writing them on the board, showing visual aid materials on which the color words were printed). Another example occurred in the science lesson in which the teacher gave an extended presentation about how leaves could be classified according to size, shape, and color. She repeatedly compared pairs of leaves explaining that she was looking for similarities and differences in size, shape, and color. The repetitive nature of her presentation and the restriction of her language to the key words "size," "shape," and "color" led eventually to the isolation of these three words as a restricted set of alternatives to respond to the question "How are these two leaves different?" When she later began asking the children to compare leaves her questions were coded as choice questions, since she had identified and reinforced "size," "shape," and "color" as the response

alternatives she had in mind and because she accepted with apparent satisfaction the responses of children who simply verbalized one of these key words without any additional material.

Self-reference Questions

Any questions which do not involve academic content and/or are not intended to elicit a particular correct factual answer are coded as self-reference questions. These include solicitations of opinions, preferences, or predictions, as well as information about the life experiences, home background, etc. of the children. Examples:

Do you have a (dog, car, cold, pencil, etc.)
When is your birthday?
Do you like (arithmetic, ice cream, this story, etc.)?
What are you doing?
Have you ever seen (a football game, the inside of a spaceship, etc.)?
Do you understand the work?
Did you do your homework?
What do you think might happen to Dick and Jane when they get home?

QUALITY OF CHILD'S ANSWER

The child's answer to teacher questions are coded as correct, partially correct, incorrect, and no response. As always, the teacher's apparent intent is the criterion guiding the coder. Responses which the teacher is satisfied with and treats as correct are coded as correct; responses which he treats as incorrect are coded as incorrect. The coding of partially correct responses frequently depends squarely on the teacher's reaction to the response more so than on the quality of the response itself. Some conventions:

1. An answer is coded as part correct whenever the teacher indicates ambivalence about the response. This means that the teacher may accept the response as correct as far as it goes but note that it is incomplete (as when the child gives only one part of a two part answer); another type occurs when the child's answer is more specific or more general than the particular one that the teacher had in mind, so that the teacher must indicate both the validity and the imprecision of the child's answer ("Well, it is an animal, but what kind of an animal is it exactly?"). Part correct answers will be coded most frequently when the child produces an answer that the teacher had not anticipated. Often this will be because the teacher's question was more ambiguous than the teacher realized when asking it.

2. Sometimes the child will make an answer that is correct in content but is not presented in a form which satisfies the teacher. Examples include shaking the head to indicate "yes" or "no" rather than responding verbally, answering the question in a word or a phrase when the teacher wants it put into a complete sentence, counting on the fingers when the teacher wants the child to do the problem in his mind, etc. These answers are also coded as part correct, since the teacher accepts the correctness of the content but criticizes the form.

No response is coded whenever the child remains silent, indicates that he doesn't know the answer, or mumbles unintelligibly. If the child does make an intelligible response to the question it must be coded as correct, part correct, or incorrect. Thus if a child mumbles an answer to a teacher's question and is asked by the teacher to repeat his answer more loudly, the answer will be coded as either part correct or incorrect, depending on the reason the teacher asked the child to repeat the question. If the teacher wants the child to repeat because she has heard his response but wants the other children to hear it or wants to avoid allowing children to mumble responses, the child's answer is coded as part correct, in that it is acceptable content delivered in unacceptable form. On the other hand, if the teacher is asking the child to repeat because the teacher has been unable to hear the child's answer and does not know whether it is correct or incorrect, the child's answer is coded as incorrect. Any mumbled answer which apparently is an attempt to answer the question is treated as incorrect as long as it remains unintelligible. Mumbling which does not appear to be an attempt to answer the question, as when the child seems to be talking to himself or perhaps mumbling "I don't know," would be coded as no response. To summarize: if the child attempts to answer the teacher's question his answer is coded as correct, part correct, or incorrect, depending on the teacher's reaction to it; if he does not attempt to answer the question or if he indicates that he is unable to answer, it is coded as no response.

TEACHER'S FEEDBACK REACTION

To facilitate comparison of examples of teacher feedback reactions to the answers of the children, examples will be given with reference to three typical teacher questions and child answers. The three situations are as follows:

Question one: What color is this? (the correct answer is "Red")

Question two: What word is this? (the word is "Bad") This question might be asked as stated or might be implied during the reading group, as when a child is reading but gets stuck when encountering the word "bad".

Question three: How do you think John feels? (the answer is "Bad" or any one of its synonyms)

Examples of teacher feedback reactions which might be made to the child's answers (or failures to answer) to the previous questions are presented below. Under each heading the feedback reactions following the number 1 refer to reactions to question one; those following the number 2 refer to reactions to question two; and those following the number 3 refer to the reactions to question three. Additional material and discussion of special situations will appear after the examples for each of the twelve categories of teacher's feedback reactions.

Praise

1. "Red!" (delivered with gusto and warmth)
   "Right -- it's red. Good, Johnny."
   "Good." (said in response to a child who has given the correct answer)
   "Yes, you really know your colors, don't you!"

2. "Good -- you remembered didn't you!"
   "Bad! Very good, Johnny."
   "Right -- you figured that out all by yourself, didn't you!"

3. "Yes, I think you're right, Johnny, that's good thinking."
   "Right, Mary! You read the story and found out how Johnny felt, didn't you?"

Affirmation of Correct Responses

Affirmation of correct answers would be very similar for all three types of questions. The teacher would indicate that the answer is correct either verbally (Yes, um-humm, right, that's right, okay, etc.) or non-verbally (nodding the head up and down). Repetition of the child's answer is also coded as affirmation unless it is delivered in a questioning tone of voice. Any of the verbal affirmation statements might be included as part of a teacher feedback reaction coded as praise if the verbal content were accompanied with non-verbal communication of warmth, joy, or excitement. When not so accompanied they are coded as verbal affirmation only.

No Feedback Reaction

The teacher is coded for no feedback reaction if he simply does not respond to the child following his answer of if he makes a verbal response which does not communicate information about the correctness or incorrectness of the child's answer. Examples of the latter: "You think it's red;" "I never thought of that."

Negation of Incorrect Answers

Indication that the child's answer is incorrect in whole or in part is coded as negation assumming that the response is confined to informational feedback and is not codable as criticism. As with affirmation, negation can be expressed non-verbally by shaking the head or verbally (no, that's wrong, that's not right, I don't think so, uh-uhh, etc.).

Criticism

Teacher feedback reactions coded as criticism include negation accompanied by gestural or expressive communication of anger, rejection, or frustration as well as direct verbal criticism:

"Maybe you'd know if you'd pay attention."
"You wouldn't make mistakes like that if you tried harder."
"Don't guess -- look at the word. You should know better than that."
"I told you to raise your hand before answering -- weren't you listening?"
"We've been over this three times already, John -- you should know it by now."
"That's not right -- what's the matter with you?"

Process Feedback

1. Process feedback is not possible in reaction to the child's answer to the first question, since the question deals with the arbitrary linguistic label which the English language attaches to the color "red." These and equivalent questions involve basic facts which must be simply memorized rather than explained. Since the correctness of the correct answer resides in arbitrary societal consensual agreement rather than in the presence of a logically based sequence or process, no process feedback is possible. In addition to color labels, other categories of questions which do not admit of process feedback include spelling, traffic signs and turn signals, and the interrelationships among units in systems of measurement. Thus process feedback could be given to a child when the question involves telling time from the clock, but not when the question concerns the number of minutes per hour or the number of hours per day.

2. Johnny, in order to read the word you have to sound it out (followed by a demonstration of how to sound out the word). When you don't know the word you can sometimes figure it out by thinking about the story so far and by looking at the picture (followed by an extended explanation of how the child might have figured out the word was "bad" by figuring out that Johnny felt bad in the story and that the particular sentence was describing how Johnny felt).

3. To figure out how Johnny feels you have to think about the story and about what happens to him (followed by a discussion of significant events in the story which would suggest that Johnny feels "bad").

Gives Answer

1. It's red. We call this color red. It's red, just like a stop light.
2. Bad. The word is bad. B-A-D spells bad. Not bed -- bad.
3. I think John probably feels bad. He doesn't feel very good, does he? He is very unhappy. (assuming the teacher equates this with "bad") He feels awful.

Asks Other

Here the teacher does not provide the answer for the child but instead asks for someone else to provide it:

Does anyone know?
Mary, can you tell me?
Can someone help John?
What is it, class? (the teacher may call for a chorus response rather than ask for a single child to respond)

Call Out

Call out is sometimes coded for the teacher's feedback reaction (although it is not a teacher response) if some other child calls out the correct answer when the first child gives an incorrect answer or is unable to respond. This includes both instances in which the child who calls out the answer is coded for response opportunity (because the teacher then turns his attention to him and makes a feedback response) and instances in which the child who calls out the answer does not get coded for a response opportunity (the teacher does not turn his attention to him and give specific individual feedback). Thus call out has a slightly different meaning for purposes of coding teacher feedback reaction than it does for coding response opportunities for individual children. Call out is coded in teacher's feedback reaction whenever the child gets feedback from another child who in fact calls out the answer; it is not necessary that the teacher give feedback to the child who called out the answer.

Repeats Question

1. What color? Well? Do you know?

2. Do you know that word? Are you stuck? What is it?

3. How does he feel? What do you think? Hmmmm?

Rephrase or Clue

1. Is it red or blue? Is it red? Is it blue? It's the same color as a stop light. It's out new color for today. It begins with "r". It rhymes with "bed".

2. Is it bad? Is it had or bad? Does he feel good or bad? Look at the first letter. What word does it rhyme with? We just had this word up here (pointing). How does Johnny feel? He feels _____?

3. Does he feel good or bad? Does he feel bad? Well, is he happy, sad, angry, or what? Look at his face. He's never going to see Sam again. How would you feel if you were Johnny? How does he look?

New Question

1. Yes, and what color is this? What else is red? Are you wearing anything that's this color?

2. Why did he feel bad? Is he crying? Did you study this story? How do you spell that word?

3. And how does Sam feel? Yes, how could you tell that he was sad? Then what happens? Why does he feel sad?

In general, the teacher's feedback to the child is coded as process feedback if he explains why an answer is wrong or if he explains what to do in order to get the right answer. If the original question was a process question, the teacher will be giving process feedback simply by giving the answer to that question. This includes the extreme case in which the child has answered the question correctly and the teacher responds merely by repeating the child's process answer. Except for the special case of process questions, however, the teacher must go beyond simply giving the answer to the original question in order to get credit for process feedback. For example, the teacher may be observing a child writing his name on the board. If she merely says "No, Johnny, you put a little 'j', your name begins with a capital 'J'." she would be coded for product feedback. However, if the teacher explained about names being proper nouns and proper nouns always being identified with an initial capital letter, she would be coded for process feedback.

The teacher may sometimes be credited with process feedback when this feedback is apparently not understood and therefore not successful.

The key consideration, however, is an attempt to communicate to the child why his response was wrong and to help him understand the processes involved, and not necessarily the child's success in reaching this understanding. Consider the following example:

Teacher: What color of clothes should you wear when riding a bike at night?

Child: Red, or maybe white.

Teacher: Don't you think you might want to wear white so that you could be seen better?

The teacher in this feedback reaction attempts to communicate the rationale underlying the choice of white as the appropriate color. This may or may not be understood by the child. The teacher is nevertheless credited with process feedback because of his attempt to delineate the rationale.

Differentiation among repeating the question, rephrasing the question, and asking a new question requires consideration of both the teacher's apparent intent and the response demand of the second question. For instance, when a child is reading and stops because he apparently does not know the next word, the teacher reaction "Are you stuck?" can be seen as functionally equivalent to "Do you know the word?" and therefore codable as repeat. However, the reaction "Did you study this?" is different. Here the teacher is not merely inquiring about whether the child knows the word or wishes to make a guess. He has shifted focus to the more general matter of the child's reading ability and faithfulness in practicing it. Consequently, this reaction is coded as a new question, since it demands a new response and is not an attempt to get the child to produce the word. The teacher reaction "How does Johnny feel?" would be coded as repeat with with reference to question three of the examples. However, its appearance in connection with question two, when the child was stuck when trying to read the word "bad", would be coded as providing a clue (attempting to help the child guess the word by using context clues).

The coding of both the child's answer and the teacher's feedback response for self-reference questions must often be arbitrary since often there is no correct answer to the question or the teacher and observer are not in a position to know whether the child's answer is correct or not (Have you ever been to the zoo? When is your birthday?).

For questions in which the teacher solicits personal opinions, he may even explicitly state that there is no one right answer. As always, the teacher's intent must guide the coding. Responses that the teacher accepts without attempts to question or correct are considered to be correct answers. Other answers are similarly coded depending upon the teacher's response to them. Coders may sometimes be uncomfortable applying the preceding procedure to self-reference questions, since it sometimes involves treating questions which have no right or wrong answers as if they did. The procedure is necessary, however, if teacher feedback during self-reference questions is to be evaluated in the context of the child's performance. Inclusion of the quality of the child's answer as part of the sequence of events coded in self-reference response opportunities makes possible the conversion of frequency codes into percentage scores which allow direct comparison of one child with another.

Even though the same procedure can be used in coding self-reference questions as is used in coding academic questions (process, product, and choice questions), these two general types of response opportunities are quite different and the coded information from them should not ordinarily be combined. That is, the teacher-child interaction occurring in self-reference questions should be treated and evaluated separately and not combined with the data from academic questions. The differences between the two types of questions and the probability that children will differ in the relative amounts of each of these two types of interactions that they have with the teacher make it likely that combining the data from the two types of questions would mask important findings rather than facilitate their discovery.

READING AND RECITATION TURNS

It is important to code interactions occurring in reading and recitation turns in the proper place on the coding sheet to keep them separate from interactions occurring in ordinary response opportunities. Interaction occurring in reading groups or other groups formed explicitly for recitation is usually easy to recognize. However, interactions which should be coded in the reading and recitation coding sheet sometimes occur in the course of normal classroom activity when the teacher is dealing with the whole class. Anytime the child is asked to read for the purpose

of demonstrating his ability to read (as opposed to his ability to understand the material), the interaction should be considered a reading turn. This is because, just as in reading turns occurring in formal reading groups, the child is required to read a passage and continue uninterrupted until and unless he either finishes or makes an error. Similarly, teacher feedback in connection with this performance is feedback to the child's reading performance, not to his understanding of the material or to an answer given to a focal question. These latter would be coded as response opportunities. Work recitations other than reading turns which have been observed include the following: recitation of poetry, lists of rules, the alphabet, or other memorized verbal material; recitation of mathematical tables; naming as many particular types of words that the child can think of (words that begin with "b", words that rhyme with "boy," etc.); recitation of the words to prayers, pledges, or songs. Coders should have reading and recitation sheets handy at all times, since interactions which must be coded on these sheets may occur at any time and are not confined to formally organized reading and recitation groups. Coders should also take care to properly distinguish between teacher feedback given in regard to the child's reading or recitation per se and teacher feedback given in connection with focal questions (response opportunities) which may be asked of the child during his reading turn. The latter is coded in the response opportunity section and not in the reading and recitation turn section, even when it occurs within a reading and recitation turn. Thus reading and recitation turns are distinguished from other response opportunities on the basis of the response demands made upon the child and not on the basis of the context in which they appear.

The system for coding teacher feedback during reading and recitation turns provides for teacher reactions to errors in reading and reciting and for the teacher's reaction at the end of the reading or recitation turn. It does not provide, however, for teacher praise or encouragement which may occur during the reading turn (rather than at the conclusion). Such teacher behavior cannot simply be coded as it occurs, since the coding would then imply that the teacher made such a positive response following an error by the child. Investigators who wish to retain this information in interpretable form should either treat it as if it occurred at the conclusion of the reading or recitation turn and therefore indicate it

with an "E" or else use some other symbol to distinguish it both from teacher reactions to errors and from the teacher's comment at the conclusion of the reading turn. The latter can be accomplished with a small case "e" or a plus sign.

DYADIC TEACHER-CHILD CONTACTS

All contacts between the teacher and an individual child that do not involve reading, recitation or a public response opportunity are coded into one of the categories of dyadic contacts (procedural, work-related, or behavioral). They are separately coded according to whether the teacher or the child initiated the interaction. Identification of the initiator of the interaction is usually a simple matter, although difficult coding decisions sometimes arise. For example, the teacher may invite initiation by asking "Does anyone have a question?" Despite this invitation, any subsequent dyadic interactions which result when children raise their hands to ask a question is coded as child created, since the child initiates each particular interaction by raising his hand to get the teacher's attention.

A child occasionally will create a work-related or procedural interaction by asking the teacher a question but will not succeed in getting an immediate teacher response. In such cases the teacher will recognize the child's request and at the same time delay his response ("Just a moment, Johnny, I'll get to you later."). This interaction would be coded simply as a child-created response, with the teacher being coded for "feedback" in response to the child's request. Later, when the teacher does deal with the child's problem (assuming that he does), this second interaction is coded as a teacher-afforded procedural or work-related contact, just as if it had occurred spontaneously without any previous activity on the part of the child. This procedure avoids double coding (crediting two created dyadic contacts) and at the same time provides a procedure for separately dealing with situations in which the teacher does follow up by contacting the child from those in which the teacher does not follow up. Although preferable to other alternatives from the standpoint of coding validity (ie., what the coding implies about the teacher and the child), this procedure loses the connection between the two contacts.

Work-Related Contacts

Work-related contacts involve discussion of the seatwork or homework that the child individually performs. They differ from response opportunities inthat no public response is involved; the teacher and the child

are involved in an individual dyadic discussion. They differ from other types of dyadic contacts in that they concern specific written assignments rather than more general aspects of the student's role. Examples:

1. Work-related interactions created by the child

Wants to know if answer is right
Wants help, instruction, clarification
Shows work after finishing
Doesn't know or remember assignment and asks help
Asks what pages to do or where to start

2. Work-related interactions -- teacher afforded

Affirms or negates correctness of work
Gives help, instruction, clarification
Comments on quality of work
Urges greater speed, care, or neatness
Gives reminders ("Don't go over the line." "Look at each one before answering.")
Specific directions ("Turn to page 16." "Your book's upside down." "Use a red crayon on this sheet.")

Procedural Interactions

Procedural interactions include all dyadic interactions which are not codable in the more narrowly defined categories of reading and recitation turns, response opportunities, work-related contacts, or behavior evaluations. Examples:

1. Procedural interactions created by the child

Wants paper, pencil, eraser, etc.
Seeks permission for washroom, drink, etc.
Finishes work and wants to know what to do
Has wrong book or worksheet and wants to exchange
Tattles on other children
Offers to do a job or errand
Reminds teacher of something or calls attention to something

2. Teacher afforded procedural interactions

Gives child job or errand
Tells child where or how to sit, line up, etc.
Gives unsolicited supplies or directions about supplies ("Go sharpen your pencil." "Pass out the paper.")
Inquires about the child's well-being
Tells child to hold feet still, sit up in his desk, keep both hands on book, etc.

Behavioral Evaluations

Behavioral evaluations include praise, warning, or criticism by the teacher directed at the child during the class for his general classroom behavior. They ordinarily occur when the teacher has not been interacting with the child immediately beforehand. Evaluations occurring in this

latter situation would ordinarily be coded as part of the coding for response opportunities or work-related interactions. Most of the evaluations coded in this category will occur in connection with the child's attention, cooperation, and performance of classroom rituals, although occasionally they will be comments made in relation to the child's academic work. In the latter case, there will be evaluations made at the conclusion of a lesson or a school day in which the teacher refers to the child's general performance. Teacher praise or criticism of this sort would not be picked up by the coding system otherwise, since it does not occur as part of a response opportunity, reading or recitation turn, and other dyadic contact. Examples:

1. Praise

"John is all ready." (has his hands folded, is sitting up, etc.)
"John's got his listening ears on today."
"John, you really knew your words today, didn't you?" (said after the lesson rather than during a response opportunity)

2. Warning

"You're too loud, John."
"Stay in your seat, John."
"Raise your hand if you want to answer."
"Try to figure out the answers yourself."

3. Criticism

"Keep your voice down, John!" (with irritation)
"John -- sit down!!"
"I told you to raise your hand first -- don't you listen?"
"Keep your eyes to yourself, John, his paper is none of your business."

Teacher Feedback in Dyadic Contacts

The categories for teacher feedback in dyadic contacts are simply coded for presence or absence of each type of feedback behavior within each unit of contact. More than one category of teacher feedback is coded if more than one type of teacher behavior appears in a given dyadic contact; however, a given category is coded only once for a given contact regardless of the number of times it may have been repeated within that contact. Each type of teacher feedback is simply coded for presence or absence within the unit and no attempt to divide this feedback into subunits is made. Praise, criticism, and process feedback are special types to be noted when they occur; otherwise the teacher's reaction is coded simply as feedback (fb). The "don't know" (?) category is used if the coder was unable to hear the teacher (this is the only case in which this category is used).

APPENDIX FIVE:

Derivation of the Scores from the Raw Coding

Use of the entire observation system for any length of time results in the accumulation of a tremendous volume of raw data. Since the data for each individual child in the class must be tabulated separately, much time will be spent in data processing. The exact procedures used in a given investigation for recording and combining data must be dictated by the logic of the problem under study, so that no attempt will be made to give general guidelines. Instead, the data processing procedures used in the present study of teachers' communication of performance expectations will be described in detail to exemplify the logic used in deriving the scores from the raw coding.

Preparing the Coding Sheets

Certain procedures vital to processing must be completed before any data tabulation can occur. As a first step, each coder should carefully check his coding sheets immediately after observing the classroom. He should be sure that all the identification information has been entered on each sheet, that all coding is legible, and that everything has been properly coded (mistakes which occur due to haste, such as entering check marks or numbers in the wrong rows or on the lines between the rows should be corrected at this time). If there are any ambiguities that need to be discussed with the project investigators, they should be discussed immediately. At this point the data should be complete, unambiguous, and therefore ready for tabulation.

Tabulation of Frequencies

In the present study frequency counts are made for each column during each separate observation for each child. For some columns (categories) this means simply summing the codes that exist for each child on the various coding sheets used that day. Coding in other columns, however, must be subdivided and recorded separately in order to preserve important coding distinctions relevant to the way the data are to be interpreted. Self-reference response opportunities and recitation turns, for example, are tabulated separately from academic response opportunities and reading turns. To facilitate this separation, all of the coding from self-reference recitations and response opportunities is circled in red on the coding sheets. This serves as a distinctive reminder that the encircled coding is not to be included when tabulating the codes for level of question, quality of child's answer, and the type of teacher feedback reaction during academic response opportunities and reading turns. This

separate tabulation in the present study is required because self-reference recitations and response opportunities are not considered to be relevant to the communication of performance expectations by teachers. Separation would not be necessary in a study in which the academic/non-academic distinction was not so important.

Response opportunities occurring during general class activities and response opportunities occurring in reading groups are also tabulated separately, partly because of the difference in the way question type is coded in the two situations and partly because there may be differences in patterns of data from these two situations which would be masked by combining the coding. Separation is also required in tabulating the teacher feedback reaction codes, since knowledge of the quality of the child's response is required before they can be interpreted. Consequently, teacher feedback reactions following correct answers by the child are coded separately from feedback reactions following part-right answers, wrong answer, and "no response" answers. Data from the procedural, work-related, and behavioral contacts, on the other hand, are simply added together without distinction as to whether they occurred in general class activities or in reading groups.

Application of the preceding rules result in the need for nine separate summary tabulations for each child. Eight of these are for the teacher's feedback reactions (One set for feedback during reading and another for feedback during general class activities, with each set containing one summary for feedback following correct answers, one for feedback following part-right answers, one for feedback following wrong answers, and one for feedback following "no response"). The ninth summary contains totals for each of the columns under procedural, behavioral, and work-related dyadic contacts as well as data from reading turns The latter information includes the number of reading turns, number of errors made during reading, the number of teacher feedback reactions in each of the feedback categories following errors, and the numbers of feedback reactions in each category following the ends of the reading turns.

The preceding totals form the basic measures which are used by themselves or in combination scores and percentages to draw inferences from the data. For many purposes the large number of separate scores outlined above would not be necessary, since combining data from separate categories would not mask relevant findings. The number of separate scores can be

greatly reduced if the teacher's feedback reactions during response opportunities in the general class are combined with those following response opportunities in the reading groups. Similarly, teachers' feedback responses following wrong child responses can be combined with reactions following "no response." Other useful scores can be obtained by combining categories. Theseinclude summing the various question types to get a measure of total response opportunities, adding afforded procedural and afforded work-related contacts to get a total number of teacher-afforded contacts, adding created procedural and created work-related contacts to get a measure of child-created contacts, and adding the categories of sustaining feedback to get the total of sustaining feedback reactions to the particular child involved.

The measures above constitute the basic frequency scores to be drawn from the coding. They can be used to compare teachers or children on how often the various codable events occur. Individual and group comparisons using these frequency scores are straight forward, providing there are no missing data; however, missing data due to absences or other difficulties introduce complex problems which threaten the validity of the data when used for frequency comparison. Simple averaging or prorating of the frequency scores for each individual is the solution that readily comes to mind, but this technique is appropriate only when there are very small situational variations in the data. When large situational variations occur (and this tends to be the case in the first-grade classrooms presently being studied), simple averaging or prorating usually is not satisfactory and might even compound distortions due to sampling error. Sometimes such corrections can be made on a rational basis which reduces the probable error. For example, frequency data for reading turns, reading errors, and teacher feedback to reading errors can be averaged or prorated, but the investigators should be sure to base their adjustments not on the data for every observation but only on the data from days in which reading turns appeared. Other situational variations are muchharder to take into account. For example, on days when the teacher allows the children to "show and tell," a large number of self-reference recitations will be coded. On days when the teacher institutes a competitive drill as a method of reviewing old material, a large number of call outs will be coded under response

opportunities. These are just some examples of a more general phenomenon: situational differences in class activity tend to be systemmatic rather than random in their effects on frequency data for the various coding categories. This means that investigators should avoid averaging or prorating frequency data when possible, and should be alert for systemmatic situational influences on frequency scores which must be taken into account when averaging or prorating is necessary.

Percentage Scores

The coding category distinctions and the maintenance of initiation-reaction sequences give the system a unique and powerful basis for inference from the raw coding: conversion of frequency totals into percentage scores allows direct comparison of the quality of teacher-child interaction in different individuals and groups, despite differences in quantity of dyadic interactions with the teacher. Most of the important inferences about the nature of teacher-child interaction, especially about the communication of performance expectations by teachers, come from the percentage data and not from the frequency scores. Some of the more important percentage scores that can be derived from the coding include the following:

1. Average errors per reading turn
2. Correct answers over total answers
3. Created work-related contacts over total work-related contacts
4. Created procedural contacts over total procedural contacts
5. Total created contacts over total created plus total afforded contacts
6. Wrong answers over wrong answers plus "no response"
7. Open questions over open questions plus direct questions
8. Correct answers followed by teacher affirmation over total correct answers
9. Correct answers followed by teacher praise over total correct answers
10. Incorrect answers followed by teacher negation over total incorrect answers
11. Incorrect answers and "noresponse" followed by teacher criticism over total incorrect answers and "no response"
12. Correct responses followed by a new question over total correct responses
13. Incorrect answers or "no response" followed by sustaining feedback over total incorrect answers plus "no response"

14. Answers followed by "no teacher feedback" over total answers
15. Process feedback over total of process feedback plus asks other plus gives answer plus call out
16. Created work-related contacts containing process feedback over total created work-related contacts
17. Praise in dyadic contacts over total dyadic contacts
18. Criticism in dyadic contacts over total dyadic contacts
19. Process questions over process plus product plus choice questions
20. Choice questions over process plus product plus choice questions
21. Academic questions over academic questions plus self-reference questions

Percentage scores such as those listed above neutralize the effects of differences in frequencies of the various kinds of interactions and allow direct comparisons of the teachers' behavior towards individuals when engaged in particular types of interactions. The first seven measures listed above provide information about the patterns of initiation of teacher-child contacts, the quality of performance by the child during response opportunities in reading turns, and the child's response tendencies in situations when he doesn't know the correct answers (guessing vs. no response). The other measures provide information about the types of response opportunities, the level of response demanded, and the feedback and reinforcement provided by teachers during response opportunities.

It is recommended that when converting frequency scores to percentages investigators use part/whole percentages rather than part/part ratios (direct questions over direct questions plus open questions, for example, rather than simply direct questions over open questions). This practice will insure that all percentage scores will vary between zero and one hundred percent and will avoid the undesirable fluctuations which can occur in part/part ratios when the denominator is very small in relation to the numerator (thus creating percentages exceeding one hundred percent).

Many other percentage scores besides those listed above can be derived from the coding in the present system, and the same principles can be applied for deriving percentage measures from coding involving variables not in the present system. In every case it will be possible to make valid inferences from the data and direct comparisons between individuals or groups provided that the coding categories included in the totals (the denominators for the percentages) have been kept "clean" so that they are

amenable to unambiguous interpretations. Since interpretation from the percentage scores is predicted on the assumption that individuals or groups are being compared on interaction with the teacher in equivalent situations, investigators must make sure that coding practices do not violate this assumption by stretching coding categories to cover a wider class of events than was originally intended, thereby diluting their meaning and their potential usefulness for drawing inferences. When unsure whether or not two types of codable events are different enough to call for coding them separately, investigators are advised to code the events separately rather than risk masking important differences by combining them into one category. The two categories can be combined later if analysis of the data supports the feasibility of this procedure.

Summary sheets to aid in tabulation of frequencies are presented following this page. Four blank copies of the first sheet ("Teacher Feedback in Response Opportunities") are required for each child: one for feedback following correct answers, one for feedback following part-right answers, one for feedback following wrong answers, and one for feedback following "no response." Coders indicate which one of the four types of quality of child's answer is involved by checking one of the four boxes at the top of the page.

Teacher Feedback in Response Opportunities

Child _____

1. + ____
2. +- ____
3. - ____
4. NR ____

General Class Response Opportunities												Observation	Reading Group Response Opportunity											
++	Aff Rgt	0	Neg Wrg	--	Pc ss	Giv Ans	Ask Oth	Cal	Rept	Reph Clue	New Q		++	Aff Rgt	0	Neg Wrg	--	Pc ss	Giv Ans	Ask Oth	Cal	Rept	Reph Clue	New Q
												1.												
												2.												
												3.												
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												25.												

Teacher Feedback to Reading Performance

Child _____

Reading Errors												Observation	End of Reading Turn											
++	Aff Rgt	0	Neg Wrg	--	Pc ss	Giv Ans	Ask Oth	Cal	Rept	Reph Clue	New Q		++	Aff Rgt	0	Neg Wrg	--	Pc ss	Giv Ans	Ask Oth	Cal	Rept	Reph Clue	New Q
												1.												
												2.												
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APPENDIX SIX

Reliability and Validity

Because of the complexity of the system, a one- to two-week training and practice period will be necessary before sufficient intercoder reliability can be established. The following procedure is recommended: (a) coders should familiarize themselves with the manual and coding sheets, discussing any questions they may have with the investigators; (b) coders should then write out their own examples for each of the coding categories and discuss these with the investigators; (c) coders should write out question and answer sequences, exchange and code them and discuss them; (d) coders should begin working in the classroom or coding video tapes of classroom interaction similar to that expected in the research.

Two or more coders should work together so that reliability (percent agreement) can be monitored. Initially coders should concentrate only on applying the coding distinctions in the system without attempting to record the identification numbers of the children. The type of response opportunity can be noted simply by entering check marks in the appropriate columns, rather than child identification numbers as will be used later. Attempts to code child identification numbers in addition to coding all the aspects of dyadic interaction included in the system will hamper most coders at this stage. Later, when the coders have learned to apply the system efficiently, they can start recording identification numbers with relative ease. Coders should write down in sufficient detail for later recovery any questionable coding situation that comes up. Short periods of coding intermixed with periods of discussion are preferable in the beginning to attempts to code for an entire morning or afternoon.

As the coders become more reliable in applying the system they can begin to code for longer time periods and to begin to identify the children by numbers as they code. A seating chart locating all of the children in the room by number should be handy for quick reference at this time. There will be frequent omissions in the early coding protocols since coders who are unfamiliar with the system, the coding sheets, and the children's identification numbers will be unable to keep up with some quick-moving question and answer sequences and consequently will miss some coding. Most of these disagreements due to

omissions will disappear as the coders become more efficient in applying the system. Once efficient application occurs, so that there no longer are constant differences between coders in the number of interactions coded, the data are ready for assessment of intercoder agreement and for discovery of constant differences in application of the system. Any constant differences which appear should be discussed with the coders, since such differences reflect disagreement in the way equivalent situations are being coded (as when one coder consistently has more process questions and less product questions than the other coder, showing that one or both coders are not properly applying the definitions of these two variables).

Once constant differences between coders and the way they apply the system are eliminated and satisfactory intercoder agreement is achieved, coders can begin to work individually. Determination of what constitutes "satisfactory" intercoder agreement will depend on the preferences of individual investigators and the degree of precision in data that the problem under study requires. As a general rule of thumb the present investigators recommend that intercoder agreement of at least 80% be attained before coders begin to work alone, and that reliability checks be made periodically to ensure that reliability is being maintained and to aid in discovery of any constant differences between coders which may appear with time. Percent agreement is determined by the ratio of exact agreement between coders to the combined total of exact agreements plus omissions (one coder coded and the other did not) plus disagreements (both coders coded but disagreed on the coding). In determining agreement on type of response opportunity, for instance, the denominator of the ratio would be defined by the sum of all response opportunities coded by coder A plus all response opportunities which were coded by coder B but not coded by A. This aggregate can be divided into four subtotals: (a) cases where both coders coded a response opportunity and also agreed on the coding of the type of response opportunity; (b) cases where both coders coded a response opportunity but disagreed on the type of response opportunity involved; (c) cases where only coder A coded; (d) cases where only coder B coded. Only instances of the first type (both coders have coded the response opportunity and agreed on the type of response opportunity involved) are considered to be agreements.

When good coding agreement is established, the percent agreement using the formula described above will exceed 80% (for most categories it will be much higher), and the discrepencies will tend to be omissions rather than disagreements. Disagreements (both coders code but do not agree on the coding) should be rare and should occur only in connection with category boundaries known to be arbitrary rather than absolute (process vs. product feedback, affirmation vs. praise, negation vs. criticism, warning vs. criticism).

Using the preceding criteria, all four of the coders trained for the present research were able to reach satisfactory performance within two weeks. This has been maintained in subsequent checks. Two of the coders are former teachers, and the other two are graduate students in educational psychology. Their data suggest that an average college student or graduate should be able to apply the system reliably.

Since the system involves objective coding of observable behavior, its validity is insured automatically if it is reliably applied according to the instructions in the manual. The only real threats to validity occur in connection with unforeseen types of interactions which the manual was not prepared to deal with. Consequently investigators must impress on coders the necessity for recording any unusual or unforeseen event in the classroom and discussing it with the investigator at the earliest possible moment. In order to make decisions in these situations investigators must have a clear grasp of their own conceptualization of the problem and the inferences concerning it that are going to be made on the basis of the data collected. If coding a particular interaction (or coding it a certain way) would introduce characteristics into the data which would violate the implicit or explicit assumptions about the data which establish the basis for inference from data to theoretical issues, the interaction should not be coded (or it should be coded in a way that is consistent with the implicit or explicit assumptions). Investigators must also be careful to avoid contaminating their data by allowing relevant biases to affect decisions about how to code unforeseen situations. Ideally these decisions should be made "blind" -- without knowledge of subject

characteristics relevant to the study. If this is not possible it will be necessary to rely on advance specification of decision rules and/or randomizing procedures. In the present study, for example, coding was restricted to interactions involving academic work and discussion, since attention was being directed to teachers' expectations for academic performance by the children. Consequently recess and other non-academic activities were not coded at all, and self-reference response opportunities and recitation turns were treated separately from the rest of the data. Similarly, the teachers' subjective intent was the most basic criterion used in determining how to code certain interaction sequences and in defining the quality of the answers of the children. Validity considerations for studies in which the system was used to collect data for a different purpose might dictate the use of different coding procedures from those adopted in the present research. Even in an objective coding system, reliability can insure validity only if the data and their interpretation conform to the logical demands of the research design.